



FRIDAY, MARCH 17, 1899.

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Contributions.

Education of Trainmen on the C., N. O. & T. P.

Lexington, Ky., Feb. 26, 1899.

To the Editor of the Railroad Gazette:

I infer from your criticism of Feb. 24 that you assume that the education of the trainmen in the use and meaning of signals is confined entirely to the illustrations given by the stereopticon. This is not the fact. The men are required to make themselves thoroughly conversant with not only the rules governing the use and meaning of all signals, but they are also required to pass written examinations. The stereopticon not only enables the trainmen to more readily explain their understanding of the signals, but it also enables the examiner to determine as to their knowledge and efficiency in this particular line. The average trainman readily makes himself familiar with the phraseology of the rules, reciting them without hesitation; but when put to the actual test he is often deficient. Take the case of a home sig-

The Baldwin Train Resistance Formula.

In 1897 (page 348), in discussing some elaborate and valuable tests of train resistances by Monsieur Barbier, we mentioned, among others, the formula for train resistance got from actual tests by the Baldwin Locomotive Works. Since that time we have had frequent inquiries for particulars as to just what this formula is and how it was arrived at. We are now permitted to publish the following explanation of the matter, which, so far as we know, is the first time that any account of the Baldwin trials and deductions has been made public. We regard this as a really valuable contribution to the actual knowledge of the world as to the resistances of railroad trains at high speeds:

"The ability of the four-cylinder compound loco-

"No stops were made between terminals, a distance of 55.5 miles.

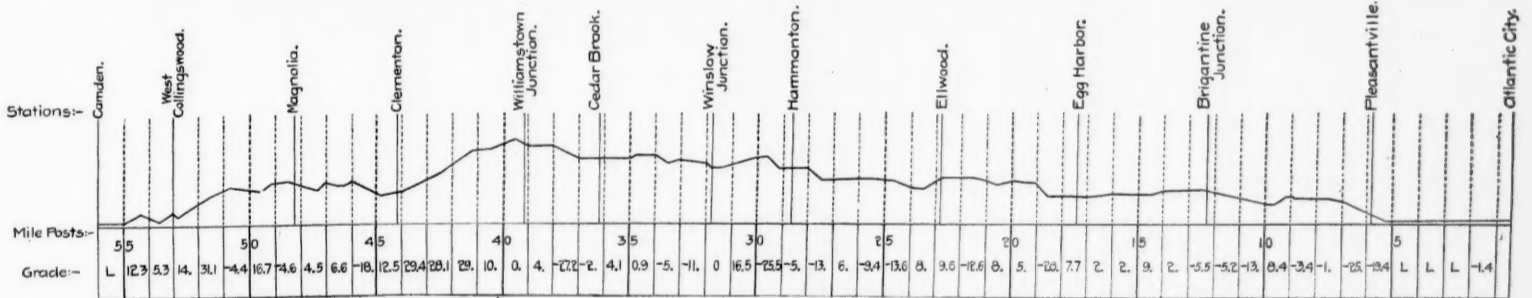
"The results of each test were tabulated and diagrams were plotted, showing a profile of the road, the indicated tractive power, as calculated from the indicator diagrams, the calculated tractive power required to overcome grade resistance, the calculated tractive power due to acceleration or retardation of speed, and finally a corrected diagram, which showed the tractive power required to haul the train on a level track at a uniform speed.

"The corrections were made in the following manner: The horse-power developed between two successive mile posts was averaged, this was then corrected for the difference in elevation and difference in speed when the train was entering and leaving this section. In order to facilitate this calculation the formula for acceleration was reduced to the form .0134V², which includes rotative energy of wheels. The results of all the tests were plotted in this manner, and from these diagrams a statement was tabulated showing the resistance per ton whenever the train was running at the rate of 45, 50, 55, 60, 65, 70, 75 and 80 miles per hour respectively. Each group of these results was averaged, all data that was obtained when the train was being accelerated or retarded to a greater extent than three seconds per mile were discarded. These averages were plotted with speed as abscissa, the resulting curve being a very flat second degree curve. A straight

line corresponding to the equation $R = 3 + \frac{V}{6}$, gives a

maximum variation of less than one pound per ton from the actual curve derived, and on account of the greater facility with which the calculations could be made, was considered preferable for a working equation.

"In round numbers the total train weights were 340, 420 and 580 short tons. Within these limits the weight of the train exercised practically no influence on the resistance per ton; the average resistance of the lighter train being but $\frac{1}{10}$ of a pound per ton higher at 45 miles per hour, almost precisely the same at 60 miles per hour, and $\frac{1}{10}$ of a pound lower at 80 miles than the resistances for corresponding speed of the heavier trains. The regularity of this variation suggests the probability that it is due to some constant cause. In correcting for acceleration and retardation the motion of translation only was considered, and on account of the regularity of the above mentioned variation, it was deemed advisable to compute one series of results in which one correction was made for the acceleration of the car bodies and trucks, and a separate correction was made for the force necessary to overcome the momentum of the car



Profile of Atlantic City Railroad.

nal with several arms; while the trainmen readily understand the different positions of the arm, "Stop" and "Proceed," they are often at sea as to the different tracks controlled by the several arms.

I may illustrate by a certain interlocking plant, the first one that was put into operation on the line. It was located at the entrance or throat of a busy yard, and between the yard and the approach to a [single-track] bridge. There were bridge signals, in connection with the electric train staff [which is used on the bridge], as well as the signals in connection with the interlocking apparatus, and to make the problem more complicated, two of the signals governing trains coming off the bridge and entering the yard had to be located on the wrong side of the track; that is, to the left of the engineer. The rules governing the operation, together with cuts plainly showing the tracks, signals, etc., were put into the hands of employees two weeks previous to the time the apparatus was put into use. The rules were made as plain as they possibly could be, and the conditions were fully explained to the employees; and when they were examined the men appeared to fully comprehend the situation; but the first week the apparatus was in use it was plain that the apparent knowledge of the men, when put to a practical test, nearly ruined the apparatus. Switches were run through, in many cases damaging the switch points, breaking and buckling the connections, etc., and the worst feature of the case was that the men did not appear to benefit by their experience. I finally went there personally and arranged for employees of all grades to meet me on the ground, where I went over the situation in the

motive to maintain a high speed in very heavy passenger service attracted considerable attention during the summer of 1896. The performance of these engines could only be explained on the assumptions:

"1. That cylinder performance of these engines was superior to our expectations, or

"2. That the resistance of trains at high speed was less than generally supposed.

"The question arose, to what extent was the performance influenced by each one of these factors. In the fall of 1896, permission was secured to, conduct a test on the Atlantic City Railroad. As will be seen by the profile the grades are very slight. This, together with its freedom from curves, renders the track peculiarly adapted to experiments of this nature.

"The engine was equipped with indicators, revolution counter and chronograph. About three indicator cards were taken per minute, and in addition to other observations, required for other purposes, the speed and the exact point on the road at which the cards were taken were recorded, the revolution counter being employed to determine the distance from the preceding mile post at which each indicator card was taken. The acceleration or retardation was determined from the chronograph record, and these were checked by an entirely separate speed observation at the time the indicator cards were taken. A number of tests were made with—

"A. A six-coach train, two of which were Pullman.

"B. An eight-coach train, three of which were Pullman.

"C. A twelve-coach train, four of which were Pullman.

and locomotive wheels and axles. The results were practically unaffected by this correction, and it was not considered necessary to make a similar correction for any of the other tests.

"General applicability is not claimed for this formula, but subsequent tests with varying train weights on a number of different roads have amply confirmed the formula at speed above 45 miles per hour and within the limits of train weights generally encountered in American high-speed passenger services."

A Method of Examining Operating Expenses.

By J. Shirley Eaton.

I.

For the purpose of an intelligent criticism, a managing officer needs a tabulated return of expenses differing in many respects from the accounts which are kept for the purpose of ascertaining the net earnings. The expense returns should be made to him in such a form as to admit of minute, critical examination at the shortest possible intervals. It is vital that the figures be fresh, and not ancient history, for the object of the examination is to find out faults and remedy them at once. For this purpose a shorter period than one month gives little information to the general officer. The accountant in these tabulations must not allow the operations of one month to overlap into another. He may with entire propriety apportion, on his books, any one expense item to several months' expenses, but the managing officer, for the purposes of his monthly examination, does not

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want these generalizations. He wants only the present facts. His total figures may not be the same as the audited expenses of the road for any one month, but in a year or more the discrepancies will disappear, because the actual expenses, as returned to him, will ultimately get into the regular accounts. Hence it is vital that all the actual outlay for operation in any one month be vouchered in that month. Nevertheless, this cannot quite be done, because some expenses, such as damages and accidents, require a long period for exact ascertainment. These should be estimated on the basis of actual accidents each month.

The distinction between expenses for passenger service and freight service or between different operating divisions should be made only when it actually exists. No such distinction should be arbitrarily made by prorating an undistributable charge, as this would be assuming what we wish to find out.

In the transportation expenses, where practicable, the line of road and the terminal charges under each head should be kept separate. On the line, one man does several kinds of work, and his wages are more or less a fixed charge, which may not have any reference to the current volume of business, while at the terminals and large stations, the work is highly organized, and by adjusting the size of the staff to the business, each man's time can be fully employed. The large terminal points call for more careful watching from month to month than the line of road. In all of the expense accounts a constant effort should be made to distinguish between fixed expenses (not materially varying with the passenger and freight service rendered during the month), and the variable expenses, which are somewhat proportional to the service rendered.

The expenses due to conducting transportation should quite accurately reflect the volume of business done. The central figure is train movement. The train-mile is the general unit, and the ton-mile is the more exact unit. Ton handled is a station expense unit. The cost of train movement includes those variable expenses which are special for each train, and which would not have been incurred if that train had not run. It includes, next, those somewhat variable expenses which are due to running all the trains. There are also expenses that are only partially due to the entire actual train movement. The form of monthly return for the managing officer's study for the purpose of reducing expenses need not vary materially on different roads, although the local conditions will suggest many additions to and subtractions from the suggested items.

It is assumed that the officer will also be furnished with full reports of work done in train movement and in train-mile, ton-mile, and passengers, express and mail carried, in order that he make his own comparisons of variable and fixed expenses with units of work done.

CONDUCTING TRANSPORTATION.

1. Train Movement.
 - Line of Road..... (a) Train and Engine Service.
 - (b) Delayed Time.
 - (c) Train Expense.
 - (d) Engine Expense.
 - (e) Water Supply.
 - Terminal..... (f) Roundhouse Expense.
 - (g) Switching Expense.
 - (h) Yardmasters, Roundhouse Superintendence, Watchmen.
2. Local Expense.
 - Line of Road..... (a) Station Service.
 - (b) Station Expense.
 - (c) Telegraph Expense.
 - Terminal..... (d) Station Service.
 - (e) Station Expense.
 - (f) Telegraph Service and Expense.
3. Contingencies.
 - Loss and Damage (a) Property.
 - (b) Stock.
 - (c) Baggage.
 - (d) Freight.
 - (e) Persons.
 - (f) Clearing Wrecks.
 - (g) Repairing Wrecked Cars and engines.
 - (h) Miscellaneous.
4. Rent of Facilities not Owned.
 - (a) Passenger Car Mileage.
 - (b) Freight Car Mileage.
 - (c) Engine Hire.
 - (d) Terminals.
 - (e) Rental of Buildings for Transportation Purposes.
5. Superintendence, Transportation.
 - (a) Labor.
 - (b) Personal Expenses.
 - (c) Stationery, supplies and other expenses.
6. Traffic—Securing the Business.
 - (a) Superintendence.
 - Salaries.
 - Personal Expenses.
 - (b) General Freight Office.
 - Salaries.
 - Office Expenses, including stationery.
 - (c) Outside Agencies.
 - Salaries.
 - Expenses (including rent and all supplies).
 - (d) Commissions.
 - Passenger.
 - Freight.
 - (e) Competitive Switching, Store Door Delivery, &c.
 - (f) Dining Car Expense—net debit.

1-a. Train and Engine Service.—Separate this into

passenger and freight, and place the road mileage against it. If the local freight is any considerable part of the whole mileage, it should also appear separately, or else an allowance on some constructive basis should be made for way switching. Run over the charge carefully by divisions. Perhaps a Superintendent has arranged his runs badly, so that a man gets a full day's pay for less than a day's work. Some Superintendent may be able to double-head profitably and save an extra train crew, while others will not be running their engines up to their full ratings. If at any time there has been a radical change in the basis of pay of either the trainmen or enginemen, or the schedule admits of any uncertainty according to varying conditions, it may be well to separate these two classes for special examination. But for ordinary purposes, they should be united in one item.

1-b. Delayed Time.—There need be no distinction between passenger and freight. It should be placed against the total mileage made. This expense is a direct reflection on the Superintendent, or else it is due to some general cause which he must be in position to locate. It indicates that the dispatchers have not been getting their trains over the road as they should, or the fault may be charged to the motive power being in bad condition; or the traffic is too heavy for the facilities and the passing sidings; or in order to save in telegraph expense; there are not enough of train order points, at least at night.

1-c. Train Expense is, next to engine expense, a large item that should be most carefully watched. For any intelligent information on the subject, the heading should be further classified into Heating, Lighting, Oiling, Icing and Watering, Cleaning, Fixtures, Tools, &c. These items should bear a definite relation to miles each season. They are the expenses which a loose management ignores. One reason for the laxity is the fact that a considerable part of this expense is incurred by sleepers and coaches in through service, for which settlement is made through a clearing house, involving a delay of two or three months, thus making the judgments on current expense impossible. We remember being called upon to explain a large increase in this account, which had much fretted the transportation department, and, after all sorts of explanations that could not be made to fit, the trouble was found in methods of a clearing house in another city. But such conditions are unnecessary. Besides showing the charges in money, the quantities should also appear. The irregularity of the practice of heating by stove or steam from the engine will tend to make the item "heating" uncertain. Icing refrigerators may be placed against the loaded refrigerator car miles. Cleaning coaches and sleepers, according to the practice of the road, can be divided into two or more kinds of cleaning, as is already the practice in several clearing house settlements. The cost of each kind of car cleaned will be a fair index to the economy practised. Oiling and inspecting should be shown against the number of freight and passenger cars handled respectively. Links and pins are a fruitful source of expense, though mainly about the yards where we also have provision for them. Fixtures for fire protection, wrecking tools, interior car fittings, &c., should be shown by passenger and freight service separately. They should run at about a normal figure, except at times of special renewals or innovation of new types.

1-d. Engine Expense.—There is perhaps no other single item of expense that will so well repay careful watching. Any road properly managed will have an engine performance sheet, and its footings should be at hand for explanation of the monthly coal consumption. The principal item of expense, fuel, may have come from different sources, or have sustained different periods of exposure to the weather, and be radically different in steaming qualities. If this be so, it is highly desirable to separate it into two or three grades roughly, and show the mileage against each kind. An appreciable general cause for variation in the coal consumption is the weather. Some authorities estimate it at one per cent. for each 2° variation in the temperature. With due consideration of these general causes we should go carefully over the showing by each division. Delayed time and poor firing and poor running are the great sources of extravagance, and a careful study of the performance sheet will make clear where the fault lies.

1-e. Line of road water supply should not reflect to any great extent the current volume of business unless it happens that the road relies on municipal or other supplies, for which it pays by measure. Regular pumpers on wages should be kept apart from other supply costs.

1-f. Roundhouse expense should include all the current expenses about the roundhouse, which are for the benefit of the engine, exclusive of the Superintendent or Roundhouse Foreman, if on a fixed salary, and also exclusive of engine repairs. It will then have a definite relation to mileage for the whole road. But for single points, because the length of runs may differ, especially if the system has a large number of branch lines, the unit should be "engines handled." Exactly what will be the definition of engines handled must be worked out by the motive power de-

partment. Some engines will be wiped, dumped and washed out, turned and packed, while others may only be turned, so that any unit devised will at best be rude.

1-g. Switching expense includes the cost of switchmen and yard engineers and firemen. It should embrace all the labor and supplies of current consumption, including links and pins used in the switch yard. Switching to repair track should not be included. Note first the ratio of this to freight train mileage. There is an obvious need for some unit of switch work. This is variously had by estimating a switch mile as equal to 4, 6 or 8 and even 10 road miles. Sometimes the number of cars handled is used as a basis. Conditions vary so radically at different yards and in the same yard with different train schedules that it is a matter of great difficulty to settle on any one satisfactory unit. Whatever the unit in use, we may place against it the items of engine costs to judge whether they are high or low. Where there is a regular yard master who gives his time largely to superintendence, his salary and expenses should be shown apart from the general body of yard expenses, because it is practically a fixed charge. Where single large terminals are under observation, the cost of different kinds of switching, as making up trains, stations and private siding delivery, should be shown separately, though the division must to a large degree be arbitrary and inexact.

1-h. Yardmasters, Roundhouse Superintendence and Watchmen is the salaried expense at terminals which has no month to month relation to the volume of business. It should be checked up periodically. If, from any peculiar circumstances, these officers incur any particular expense for stationery or telephones, etc., it might be well to withdraw such charges from roundhouse and switching expense and watch them.

2-a. Line of Road Station Service should not vary from month to month unless the road had some particular commodity, as the cotton or wheat crop, whose movement is congested at one particular season, and such congestion is general over the entire line. To provide for such possible expansions on roads where they occur, the service should be split up into agents, and clerks and laborers, where clerks and laborers are additional men. This will show at any time whether there has been an increase in the permanent staff, which is the important thing.

2-b. Line of Road Station Expense is all the current expense of the station outside of the payroll. Thus it will include stationery and all supplies. It should be practically a fixed charge according to the season of the year. Being a practically fixed charge, it should be periodically checked over most carefully.

2-c. Line of Road Telegraph Expense includes only those expenses that are incurred for the telegraph exclusively. The salary of agents who are also operators should not be charged to this item, unless it be that they are only nominally agents, when their entire expense should be placed here and no part of it charged to station agents. This charge will not show great variations, except upon changes in the rates paid, or irregularity in the number of night offices, or radical changes in the methods of moving the business.

2-d. Terminal Station Service Expenses are almost as largely within control as the terminal costs of trains. In scrutinizing them closely, the expense of agent, chief clerk and cashier should be first withdrawn, and the balance separated into clerical and labor costs. The labor should show the expense of transferring separate from the rest of the work. Against the clerical costs we may place the waybills made, and against the labor the tonnage L. C. L., the solid cars, the stock cars and the cars transferred or "worked." There will still be other miscellaneous items, but these can be bulked.

2-e. Terminal Station Expense corresponds to the same charge for line of road stations, except that it should more closely conform to the volume of business.

2-f. Terminal Telegraph Expense should be separated into dispatchers and operators, the former being those who are permanently necessary for train movement, and the latter being those who may be taken off or put on according to the volume of business. On roads keeping a record of the number of words to each message, there is always at hand a measure of the operator's work. If this is not done we may take the number of messages received and sent. It is true there are times when the wires are burdened and operators cannot "get in," but in the long run such a unit is an approximate measure of the work done by operators. Dispatching is a high order of service, and as such must be considered a staff service, not to be directly placed against current result units.

3. Contingencies.—These are the irregular variations from the normal way of doing things, which for the most part are called accidents. By withdrawing them to an item by themselves we are able to probe them to the bottom. The ultimate measure of an accident is its cost in money. This, of course, cannot be had for any monthly statement. We will assume that the figure we have is an estimate of the department charged with finally settling for the

claims arising in this month. This is the nearest money equivalent of that form of expense that can be had. Examine it by comparison with the average monthly figure deduced from some long period, as a year. It must be an estimate of the money cost of the accidents, not of the number of such accidents, for that is the actual fact which we want to know definitely. By property is meant all property not in the hands of the railroad for transportation, excluding stock for which a special item is provided. Repairing wrecked cars is withdrawn from the regular car repairs charge, because it is an extraordinary expense, resulting directly from irregular work of the transportation department.

4. Rent of Facilities Not Owned. This is a fixed variation from type or from the normal way of doing a thing. It is occasioned by defect in the property, or insufficient facilities. It will include rent of buildings, terminals or equipment. Take care that the rent for buildings and terminals shows no increase whatever. If any rents are paid on other than a calendar basis, withdraw them and watch them by themselves. Hire of equipment, either on mileage or rental basis, should not increase without explanation. That it has increased does not necessarily imply extravagance, for the causes may be a lack of equipment or special reasons, having their effect in other accounts. One special reason may be the saving in the expense of transferring freight.

5. Superintendence is closely allied to the foregoing account, because of its nature as a practically fixed charge. This item depends on the general policy of the road and cannot well be measured against anything but itself in other periods. It may be well to separate it to Superintendents, Trainmasters and their clerks. Their expenses, supplies, stationery, etc., however, should be kept separately.

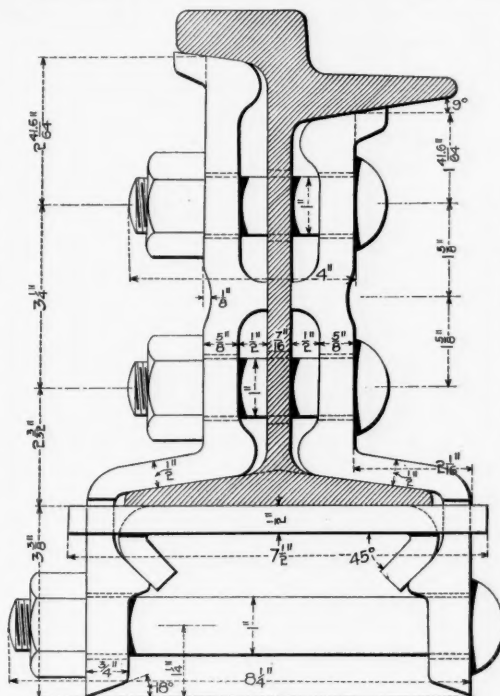
6. Traffic.—The cost of securing business is one remove further from the costs that are directly affected by the volume of current business. In fact, it may sometimes be policy to invest more money in soliciting when the traffic is lightest. Such an item is Outside Agencies. Competitive switching is what the road pays to get business that could not otherwise be had. The amount paid is not within control from month to month, but is dependent on the volume of business offered. Commissions are of the same general nature, except that the rate paid may be within control. Therefore, increases in these items may be noted as explaining increases in the total expense, but they cannot themselves be explained except as indexes to desirable increase of business. Outside Agencies differ in this respect that their relation to the business secured is not a fixed thing. It may be grossly high, either through impolicy of bidding so high for business, or the lax administration of the agencies themselves. Its increases call for explanation. Closely allied with this is the deficit from dining car operations. These operations should bear not only the direct expense of victualling, manning and cleaning, but also the indirect expense of repairs, oiling and inspecting, car hire, etc. They represent a definite outlay to secure the business and their expenses in all propriety is a traffic expense. Their net earnings should be placed in the general revenue of the road. Of the same general nature is extraordinary service, such as store door delivery at competitive points, mileage paid for the use of unusual types of cars as a traffic consideration, nominal demurrage charges remitted, etc. The Traffic Department should not escape these expenses because they have gone to swell the charges to the transportation department in the regular accounts. Bonuses, small gratuities, management expenses, etc., incidental to fostering the business should be shown under a separate head.

[In a following issue of the Railroad Gazette this article will conclude with an examination of "Maintenance of Equipment," "Maintenance of Way," and "General" expenses.]

Journal Box Lids.*

In years past I have had some experience with the prevalent types of oil box lids, and quite extensively with the Fletcher lid, and I have seen the Fletcher lid go through quite a number of changes and modifications in order to overcome the difficulties that there were had with it. Efforts were made at one time to lighten it, because it was found that in winter time, on roads that ran over frozen ground, the jar would be such as would often times to open the lid, and with a heavy cover the jar would be such as to break the bolts off sometimes, after a number of months of service on frozen ground. On the Boston & Maine I have seen passenger trains come in with many covers down, and some of them missing, where the bolts had been broken. Then the cover was lightened, and the ledge was made deeper, and even then it was necessary to fit them carefully, and where malleable iron or steel covers were used to see that the covers fitted the machined surfaces of the boxes perfectly. The results were better, but even that did not prove sat-

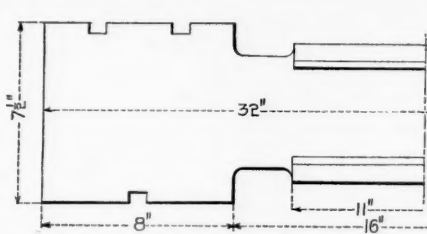
isfactory. Then the change was made of putting the bolt, from which the cover swung, at the top, the idea being that the cover would naturally drop to a vertical position and be in the closed position, even though carelessly handled. But for some reason or other that did not prove satisfactory. The bolts at times would break off in the winter time. In the summer time everything seemed to be all right. Furthermore, if the covers were not machined, or



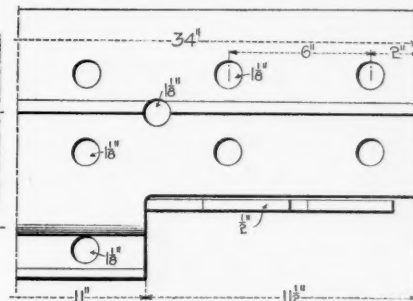
Churchill Joint on Girder Rails.

very carefully fitted to the machined surface of the box, the dust would get in on either side just the same as with the hinge lid.

The hinge lid originally was made without any protection against dust getting in, either at the top or at the sides. Later on, when the present M. C. B. standard was adopted, provision was made so that there would be more protection at the top, and latitude was given, provided the general dimensions of the lid were followed, to make some provision against a current of air through the box, which would carry dust in. Others, later on, have devised a more perfectly dust-proof lid on the M. C. B. form, and adhering to the M. C. B. dimensions, so that that special lid, if removed, can be replaced by the M. C. B. lid if one of the special ones is not on hand; and in that device, the McCord lid, they have made a broken joint all the way around the lid, not only by the ledges on the inside of the box on the sides, but at the top and bottom of the lid, it dovetails with the box, so that dust seems to be absolutely excluded from the top and from the bottom, and to a great extent from the sides. I think where boxes have been examined that have had those lids, they have been found with the waste comparatively free from dust



Half Plan—Under Side of Bottom Plate.



Half Elevation, Outside Plate.

Churchill Joint on Girder Rails.

and dirt, and the results quite satisfactory, as compared with the old style hinge lids, or, in fact, with many of the Fletcher lids. The top hinge lid made that way seems to have an advantage that it requires no machining. All it does require is that, if the malleable iron in the lid is warped, care be taken to straighten it, so that the dovetail parts will interlock and the lid go down to its seat properly.

In fact, in any type of oil-box lid, the lid and the box cannot be thrown together. It has to be put on with care and afterward receive proper attention. I must say that comparing the lid that we are now using quite extensively, that I have described, with other lids that I have had some experience with, I think, altogether, this old M. C. B. type perfected is still a good one; I have yet to see any that, altogether, in my mind, has superior advantages over the M. C. B. type perfected in this way.

The Churchill Joint as Applied to Girder Rails.

The Churchill joint, devised by Mr. C. S. Churchill, Chief Engineer of the Norfolk & Western Ry., has been well known for some years, and is in considerable use on steam railroads. It has recently been adapted to street railroad work with girder rails, and the engravings show it so applied. The application here shown is to the nine-inch girder rails of the Boston Elevated Railway Co., the joint being made by the Diamond State Iron Co., of Wilmington, Del. The engravings show the dimensions and construction so completely that no further description is necessary.

Inspection of Automatic Block Signals.

A report of the last meeting of the Railway Signaling Club was given in the Railroad Gazette of March 3, p. 150. Among the comments on Mr. Short's paper was one from Mr. G. W. Blodgett, of the Boston & Albany, sent by mail, which for some reason was not read at the meeting. We give Mr. Blodgett's paper below. In passing we should mention another written communication, that sent by Mr. W. W. Lavarack of Chicago, who called attention to the frequency with which the terms "rear" and "advance" are incorrectly used in discussions on signaling. The starting point in considering signals is the train. A signal forward of the engine is in advance of it. One behind the train is in the rear of it. It is also in the rear of the first-mentioned signal. Bearing these simple fundamentals in mind one need never make such a mistake as to say that the distant signal is in advance of the home, or that the derail is in advance of the danger point.

Comments by Mr. Blodgett.

In the beginning, there is no choice but to put the experienced and competent men in charge of the signals, however few the men or however many the signals, as it is worse than useless to put green men in the care of signal apparatus. The only practicable plan I have found is to put good men in charge of all the signals, giving them as much assistance on battery and miscellaneous work as they may need, choosing for helpers young, capable and energetic fellows who will in time make signalmen. The time it takes to train a signalman to sufficient competence to work by himself varies much with the character and capacity of the man, and also depends considerably on the kind of man he is with. Some men are good workers, but have little aptitude to teach anyone else, while others make better instructors. Occasionally I have found a man who was jealous of an assistant and would give him as little information as possible.

I think an average time of instruction to attain sufficient familiarity with the work to be able to take charge of a section of signals is about two years; but long before this a bright young man becomes able to detect the cause of and apply the remedy to the ordinary troubles that occur in practice. It is in the occasional cases of derangement that are due to remote or very rare causes that the judgment and experience of the thoroughly trained man become necessary. However long the time or thorough the training, at last the new man must depend on himself, and this tests his quality as no amount of previous practice can do.

I try to give a man at first a section adjoining that of an experienced man, in order that he may sometimes be brought in contact with him and get advice or information on difficult points as they develop in his practice, while still holding him responsible for the actual condition of the apparatus. When practicable I choose a section where the traffic is light and the conditions less exacting than on the busy lines, as the results are better than where a new man is given at once charge of one of the most important sections.

Whether it is better to give a man few signals and have him do all the work, or many signals with one or more battery men to assist, depends on the character of the traffic and the distance between the signals. If the blocks are short, one good man can keep a great many signals in order, but cannot do all the battery work in connection therewith; to oblige him

* Extracts from a discussion by M. A. M. Waitt, General Master Car Builder of the Lake Shore & Michigan Southern, at the January meeting of the Central Railway Club.

to do so is to pay nearly double the cost of this part of the work if done by cheaper men, with no corresponding gain, as the most experienced signalman can do no better work on batteries than a less competent man who has been trained in that part of the work. A good rule to follow would seem to be this: Whenever the amount of battery work to be done will take a considerable proportion of a man's time (say more than 25 per cent.), let him have more signals and an assistant to care for the batteries and to be learning other parts of the business; but if the battery work would take a less amount of time, let the signalman do it.

On the road with which I am connected velocipede cars are not allowed; the traffic is too dense for their safe use. Hence signalmen depend on trains, and for short distances they walk if no train is available.

In addition to telegraphic reports, a blank card is filled out for every case of a train stopped by an automatic signal, with the cause if known (as "train in the block ahead," "switch open," etc.); if not, "cause not known" is reported. Thus we have the credit side of the account as well as the debit, which is of value at times, to show how much the signals are of service in keeping the trains properly spaced. Those reported "cause not known" are investigated, and reported on by the signalman as soon as possible.

The most efficient means I have found for detecting faulty working of automatic signals is to place the signal about 200 ft. in advance of the operating point, so that the engineer may always see it operate for his train. By no other method I have seen or heard of is it possible to observe the working of each signal for every train. Hence the very first case of derangement or irregular working may be discovered, while otherwise it may go a long time undiscovered.

It is essential that a signalman should be a fair climber, and know how to do ordinary line work; and all joints in line wires should be soldered at the time they are made, but care should be taken not to put too much line work on a signalman, or the other parts of his work will suffer.

I cannot agree with Mr. Short as to the reliability of a shunt circuit alone for a switch-box connected with an automatic signal; there are too many cases of failure, and a derangement is never known in advance. I prefer to use a break and a shunt, not depending on either alone, but so arranging the con-

desired, but in this case that does not seem necessary.

I have had no experience with signalmen maintaining lamps, and, in my opinion, trackmen can be taught to do this with good results, with occasional repairs to the lanterns in the shops. If a burner works badly, it is usually cheaper to throw it away

the outer edge of the business and shopping districts and entailed long walks for passengers using them, thus placing the elevated railroads at a disadvantage as compared with the surface lines, which reach all portions of the heart of the city.

The Union Elevated, *opened for traffic October 4, 1897, solved the problem. Its location on Lake street,

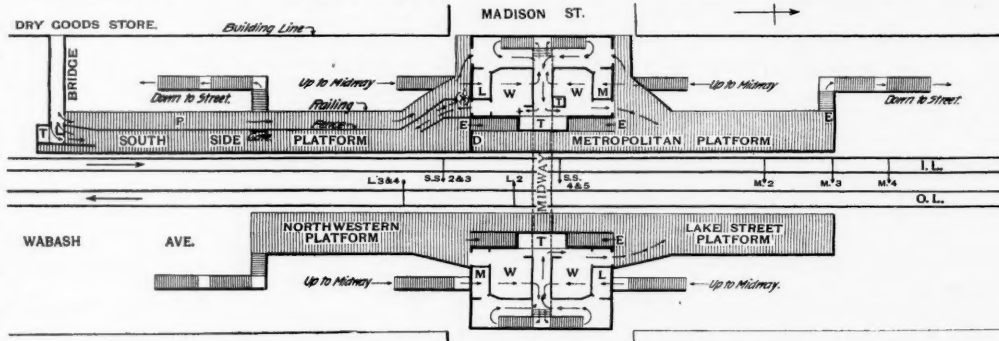


Fig. 1.—Wabash Avenue and Madison Street Station, Union Elevated Railroad, Chicago.

REFERENCES.—L. L., Ladies' Toilet; M. M., Men's Toilet; W. W., Waiting Room; E., Exit Gate; T., Ticket Office; D., Dividing Fence; P., Passage to Dry Goods Store from Metropolitan and Lake Street Trains. The letters between the tracks indicate where trains stop. For example, M2 indicates the stopping place for the motor of a two-car Metropolitan train.

than to try to repair it. It is not difficult to so gage the amount of oil supplied to the lamp, and the height of the flame, that it shall last the whole night, and go out when the oil fails, thus saving a trip to extinguish the light in the morning. Near stations, lanterns are cared for by some person designated for the purpose, and not usually by the trackmen.

The Chicago Elevated Loop.

By Henry M. Sperry.

The Union Elevated Railroad or "Loop" was built to provide terminal stations in the heart of the city of Chicago for its three elevated railroads, namely: The South Side Elevated, $8\frac{1}{2}$ miles long, first opened for traffic in 1893, with its northern or "down-town" terminal in Congress street, near State street; the

Wabash avenue, Van Buren street, and Fifth avenue, comprising a line two miles in length, completely encircled the heart of the city and provided a loop terminal for each of the three roads; and it is also designed to accommodate the Northwestern Elevated, 7 miles long, now under construction. The loop is a double-track structure, with eleven stations for the accommodation of the four roads and one station for the Lake street only. The location of the stations is such that no portion of the heart of the city, comprising the business, shopping, hotel and theater districts, is at a greater distance than three blocks from any one of these stations. The trip of a train around the loop takes 14 minutes, the stops at the stations occupying from 8 to 15 seconds each.

Stations.

The stations are unique, in the fact that although they have but two platforms and two station buildings, there are actually four distinct stations, one for each of the four roads. Fig. 1 shows a plan of the station on Wabash avenue at Madison street.

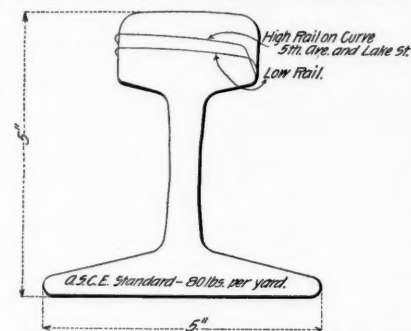


Fig. 6.—Wear of Rails in 13 Months on Union Elevated Railroad, Chicago.

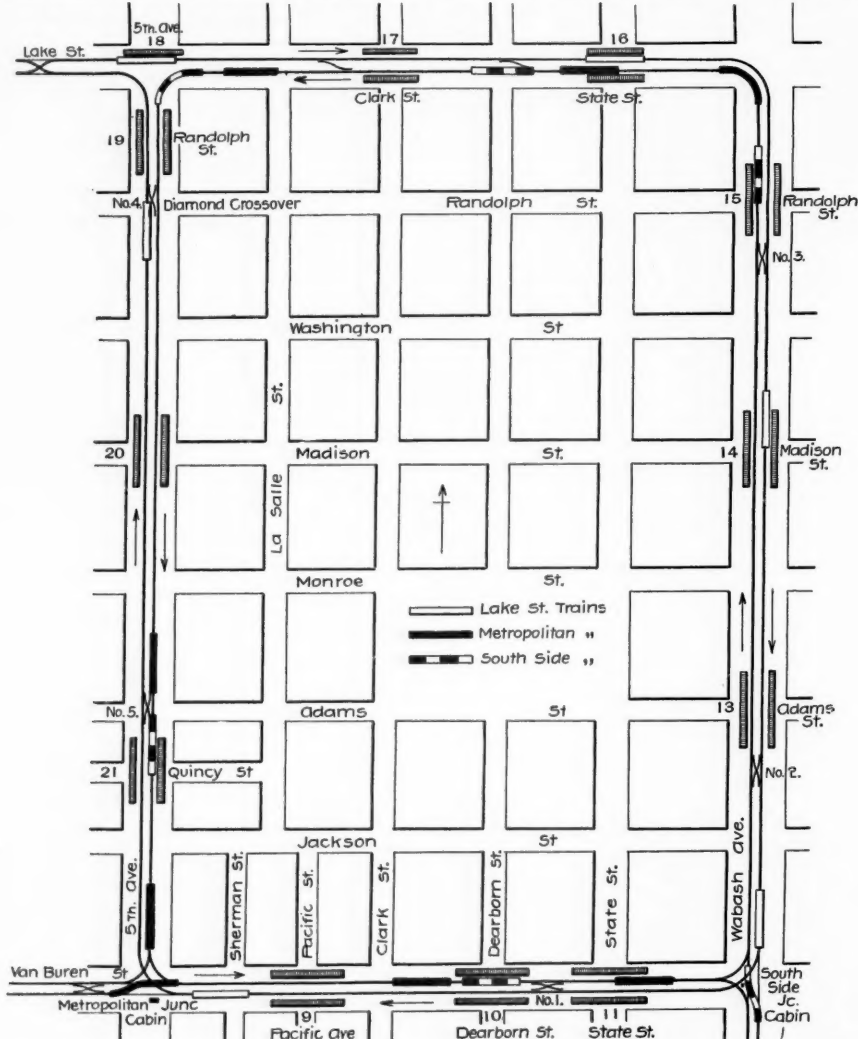


Fig. 3.—Union Elevated Railroad, Chicago, Showing the Position of Each Train on the Road at 7:45 a. m., August 10, 1898.

nections that when the switch is thrown the battery circuit is left open and the relay end of the circuit closed on itself. A still better method, in my judgment, is to carry the signal circuit itself through the switch-box, thus making the movement of the switch act directly on the signal, and not indirectly through the relay. The track circuit may also be broken if

Lake Street Elevated, 7 miles long, first opened for traffic October 6, 1893, with its terminal at Madison and Market streets, and the Metropolitan West Side Elevated, with 33 miles of road, first opened for traffic May 6, 1895, with its terminal on Franklin street, near Jackson Boulevard. All of these terminals were inconveniently located. They were on

The two waiting rooms and ticket offices on the platform level are divided through the center, thus making four complete stations. They are reached from the street level by four stairways, leading to what are known as the midway floors. These floors, which are directly under the waiting rooms, are connected by a bridge under the tracks, thus giving access from one waiting room to the other without the necessity of descending to the street level. All the stations on Fifth avenue, Van Buren street and Wabash avenue are provided with this midway passage. The waiting rooms are reached from the midway floor by four stairways, and the exits from the platforms are by four stairways outside of the waiting rooms leading to the midway floors. There are also exits from the platform level to the street level by separate stairways at the ends of the platforms. Gates are placed at all these exits and are operated by rope connections by the platform men. At Madison street the north halves of the platform are used by the Metropolitan and Lake Street trains, and the south halves by the South Side and Northwestern trains. The exact position at which these trains should stop at the platforms are indicated by small signs placed between the tracks.

The large dry goods store of Schlesinger & Mayer is reached directly from the Madison street station by means of a handsome bridge erected by Schlesinger & Mayer (see Fig. 2). Access to the Metropolitan and Lake Street stations is by special passageway, and for the South Side by ticket office at end of bridge. As this store reaches through to State street, passengers can enter the store at State street and reach the bridge level by the store elevators; this convenience is greatly appreciated by the customers of

*The structures of the Union Elevated railroad were briefly described in the Railroad Gazette of May 1, 1896.

the store. There was considerable opposition on the part of property owners to the erection of this bridge and the matter is now in the hands of the Supreme Court. Schlesinger & Mayer are the first in the history of elevated railroads to provide such facilities for their patrons. At the State and Van Buren street station, A. M. Rothschild & Co. have arranged a special entrance from the platform to their store.

Fig. 3 shows a diagram of the road. The accompanying double column table shows a list of stations, the force employed, number of passengers unloaded (from actual count) and loaded, for one hour, August 15, 1898. The traffic has

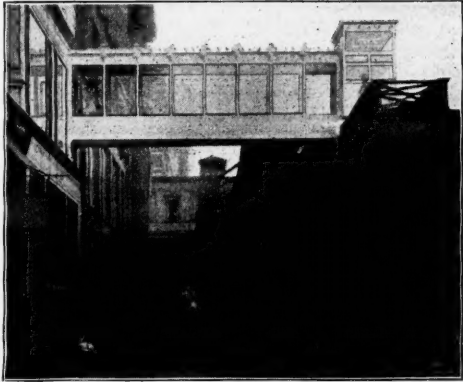


Fig. 2—Bridge to Dry Goods Store from Elevated Railroad, Chicago.

largely increased since this count was taken. The table also shows the record made on October 19, Jubilee day, which is the banner record of the Union Loop. Supplementing the table, it may be stated that 48 per cent. of the traffic of October 19, 1898, or 66,211 persons, was handled in a period of three hours during the afternoon.

The number of trains and cars during the 24 hours beginning 7 A. M. October 19, 1898, was as follows:

	Lake St.	Metropolitan.	South Side.	Total.
Trains.....	312	654	390	1,356
Cars.....	988	2,369	1,545	4,842

For six months the number of trains and cars was as follows:

Month.	Per Month.		Per Day.	
	Trains.	Cars.	Trains.	Cars.
1898.				
August.....	29,855	80,113	1,663	2,584
September.....	29,855	81,112	1,663	2,570
October.....	34,272	95,418	1,106	3,078
November.....	33,282	92,909	1,109	3,097
December.....	34,632	99,704	1,117	3,216
1899.				
January.....	34,174	94,457	1,103	3,048

At the Metropolitan and Lake Street stations the agent receives and registers the fares, no tickets or turnstiles being used. The South Side agents use turnstiles except during the rush hours, when it is necessary to use "chop boxes;" and at the State and Van Buren street station the "chop box" is in use at all times. In using these two different methods of handling fares, the roads follow the practice in use at the stations on their own lines, with the exception that the Lake Street, at a number of stations of light traffic, employs no agents whatever, the train men being required to collect fares and register by bell punch.

All the stations and the two interlocking cabins

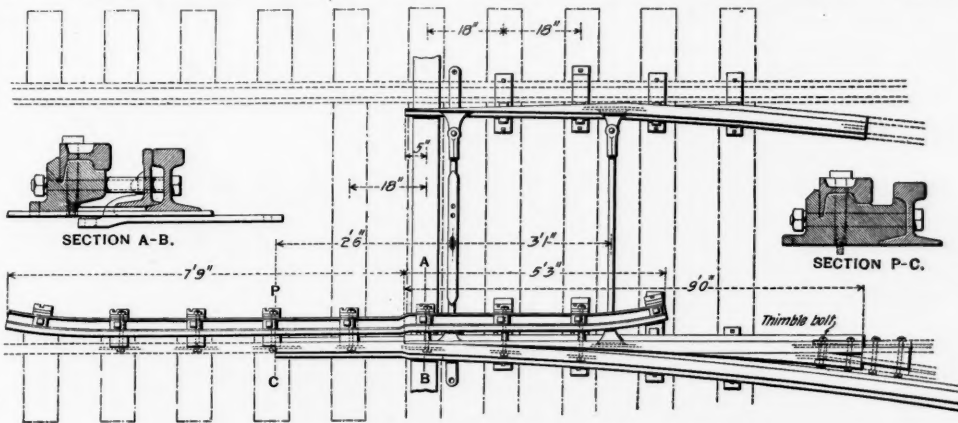


Figure 4.—Standard Switch, Union Elevated Railroad, Chicago.

are connected with the Superintendent's office by telephone; the cabins also being connected by telegraph. Platform men are in charge of the exit gates and also perform police duties.

In addition to the force directly in charge of sta-

Union Elevated Railroad—Stations and Traffic.

Station Number.	Stations.	One hour Aug. 15, 1898— 7:30 a. m. to 8:30 a. m.						Loaded 24 hours—7 a. m. Oct. 19 to 7 a. m. Oct. 20, 1898.			Force.				
		Unloaded.			Loaded.			Lake St.	Metropolitan.	South Side.	Agents.			Platform.	Porters.
		Lake St.	Metropolitan.	South Side.	Lake St.	Metropolitan.	South Side.				Lake St.	Metropolitan.	South Side.		
9	Pacific Ave. and Van Buren St.	175	1,150	100	175	110	330	1,877	5,323	3,172	2	2	2	2	1
10	Dearborn St. " "	250	700	40	155	370	390	1,797	6,153	2,517	2	2	2	2	1
11	State St. " "	250	750	10	420	700	580	4,165	10,796	6,706	2	2	4	2	1
13	Adams St and Wabash Ave....	280	540	740	280	560	150	4,632	5,980	6,192	2	2	2	2	1
14	Madison St. " " " "	425	1 270	780	420	965	270	3,806	7,326	5,743	2	2	3	3	1
15	Randolph St. " " " "	240	560	325	300	630	190	2,130	2,597	2,737	2	2	2	2	1
16	State St. and Lake St.....	270	180	150	220	580	250	3,295	2,868	2,790	2	2	2	2	1
17	Clark St. " " " " "	300	255	230	400	250		3,559	3,866	3,784	2	2	2	2	1
18	Fifth Ave. " " " " "	10			80						2				
19	Randolph St. and 5th Ave.....	460	225	465	515	590	590	4,702	3,480	3,391	2	2	2	2	1
20	Madison St. " " " " "	50	150	500	550	1,190	800	3,460	6,197	4,303	2	2	2	2	1
21	Quincy St. " " " " "	200	50	700	356	1,050	700	1,505	3,775	3,459	2	2	2	2	1
	Total	2,910	5 830	4,040	3,555	7,145	4,500	34,868	58,361	44,794	24	22	25	23	11
	Grand Total		12,780			15,200			138,023					105	

tions, shown in the table, the following are employed:

Superintendent's office: Superintendent, 1; chief clerk, 1; station inspector, 1; night dispatcher, 1; operator, 1. Interlocking: Signal men, 10; signal

Track.

Details of track construction had to be arranged with reference to the heavy traffic and the difficulty of making renewals without delay to trains. The rails are A. S. C. E., section, 80 lbs. per yard, 60 ft. in length, with Weber

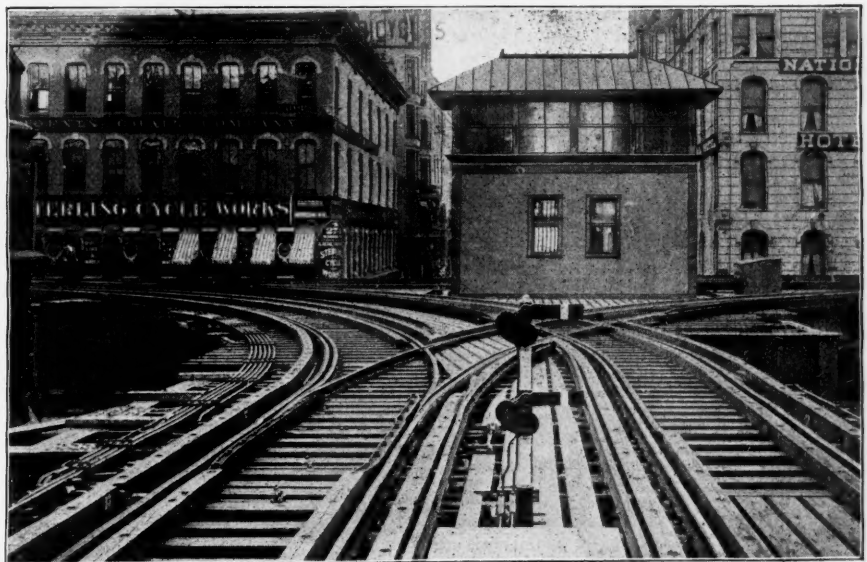


Fig. 5.—South Side Junction, Union Elevated Railroad, Chicago.

man, extra, 1; foreman of repairs, 1; helpers, 2; helper at night, 1. Track department: Foreman, 1; track men, 2. Agents: Extra agents (days 5, nights 5), 10; extra platform men, 4. Stations, light and

joints and vulcanized ties. The switches are of a special design by the Paige Iron Works, of Chicago. Fig. 4 shows details of construction and Fig. 5 a view of switches in place at South Side Junction. These have given excellent results, as the wear and tear on the switch points is provided against by the guard rail construction. A new design of crossing frog is now being tested at Metropolitan Junction in which the points of the frog have been cut out of a solid block of tool steel with the expectation that this will add materially to the life of these frogs. Fig. 6 shows a striking example of the wear of the track on a busy road, being two sections of rail taken from the curve of inside track at Fifth avenue and Lake street after 13 months' use. It is estimated that some four million wheels have passed over these rails. The curve is 90 ft. radius. On straight track the wear is not excessive, and rails should last at least 10 years.

Illinois Central Improvements at McClain.

The Illinois Central is now preparing to elevate the single track approaches on either side of the Ohio River at McClain and Major, Ky., about six miles south of Evansville, Ind. It is estimated the work will cost approximately \$150,000, and additional right-of-way has been purchased to permit of widening the embankments, amounting in all to about 68 acres at this point. Passenger trains are usually taken across the river on ferry boats, but in cases of high water the approaches to the river are

flooded, making it necessary to detour such trains so as to cross the river by the bridge at Henderson in the same way that freight trains are usually handled. By elevating the approaches above high water it is expected that passenger trains can reach the ferry at all stages of water.

At this point the river is entirely in Kentucky, and the elevation will begin at about the Indiana line, and the tracks south to the river will be raised about 7 ft.; in this section there are several small pile trestle bridges which will be rebuilt, as well as one 600 ft. and another 200 ft. long. On both sides of the river steep inclines reach from the top of the embankment to low water, so that the transfer boat can readily be reached when the water level is at different heights.

On the south side of the river the distance to high land is 3,800 ft., and of this 1,900 ft. will be a pile trestle, while the tracks will be raised 6 ft., making the new grade above the present high water line. The slopes will be protected by heavy rip-rap to prevent washing. It is expected to complete the work this summer.

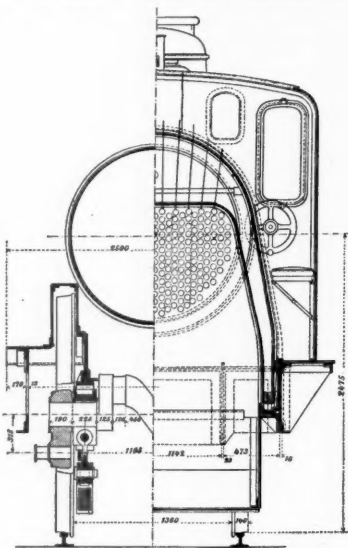
The "Atlantic Type" Locomotive in Germany.

Last summer six locomotives, built at Krauss & Co.'s Locomotive Works, Munich, were put in service on the Westphalian railroads; these engines are of a design closely resembling the "Atlantic type." Although the German engines are a little smaller than the last Baldwin compounds of that class, they are worthy of a close study by American railroad men, on account of the excellent proportions and the several novel features which are embodied in their design. The following general description has therefore been translated from an article by Mr. von Borries in a recent number of the Organ, from which also the engravings are reproduced.

The firebox is a cross between the Wootten style and the old American type, which is possible through the peculiar construction of the plate frame. Not being as shallow as the Wootten or the modern Belpaire, it is better adapted for the grade of bituminous coal available in the district. The unusual

of a larger quantity of water at the place where the steam generation is at its maximum; i. e., at the back end of the tubes and the back flue sheet.

Two single expansion cylinders are used, principally for the sake of simplicity, because these loco-



German Atlantic Type Engine.

motives, besides pulling the fast through trains on the main line, are also used on the branch lines, where a short run and short lay-over at the end of the line permits but little attention to be bestowed on the engine; but in order to obtain the greatest possible economy, inside cylinders have been selected. The experiments of the last few years on the State Railroads of Baden have shown that inside simple cylinders give as good economical results as outside compound cylinders, principally on account of reducing the exposed surfaces to a minimum. The crank axles are made of Krupp's cast steel, with a straight connection between the main rod journals. A large num-

The cab and the smokebox front are designed with a view of offering the least air resistance. Folding seats are provided in the cab, which also contains a speed indicator and a self-acting sanding arrangement, in addition to the usual equipment.

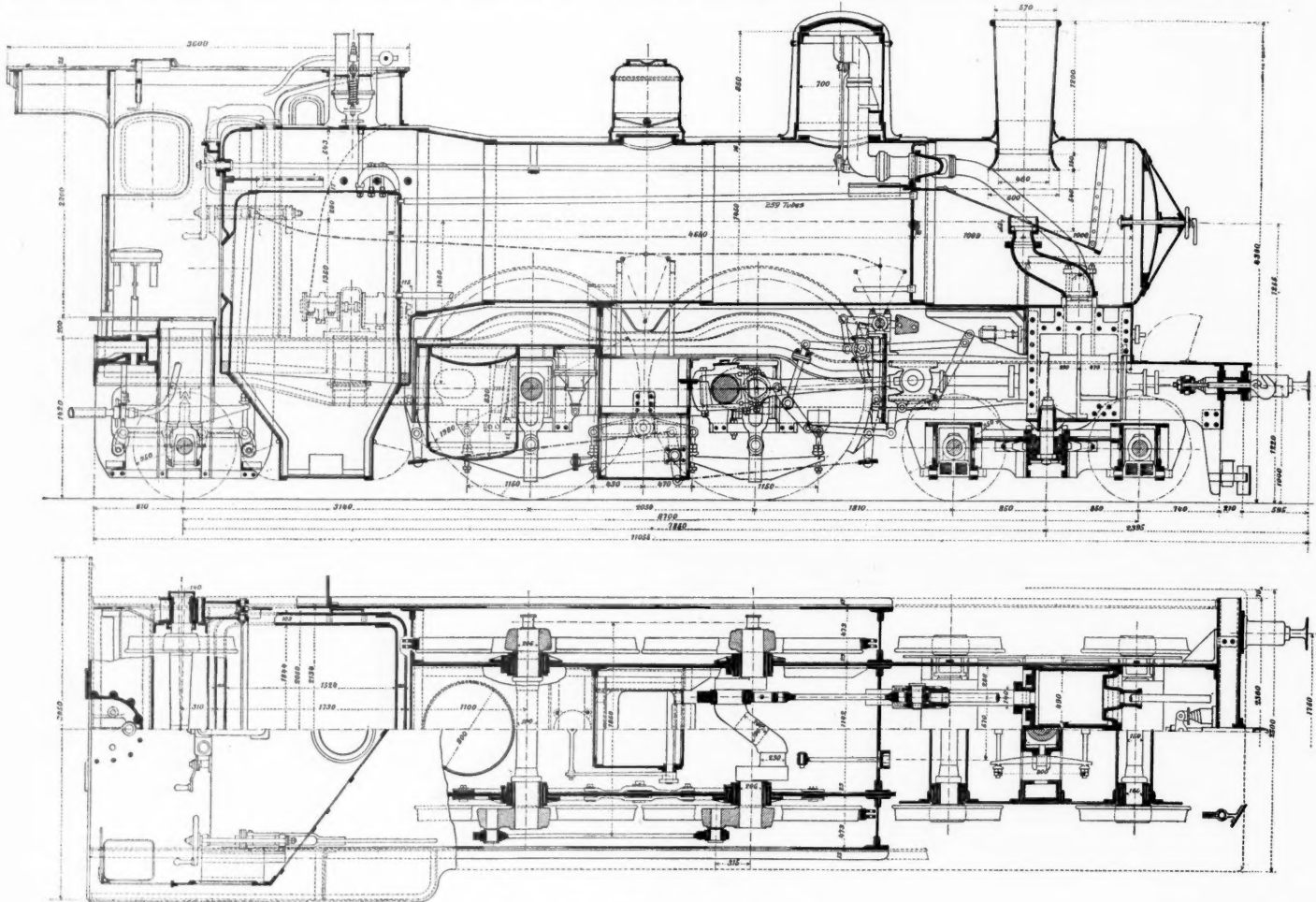
The following are the principal dimensions of the locomotive:

Grate area	30 1/4 sq. ft.
Diameter of boiler	57 in.
Number of tubes	259
Outside diameter of tubes	1 7/8 in.
Distance between flue sheets	15 ft. 3 in.
Total heating surface	1,849 1/2 sq. ft.
Steam pressure	19 1/2 lbs.
Cylinder, diameter	19 1/2 in.
stroke	22 3/4 in.
Length of main rod, center to center	5 ft. 7 1/2 in.
Diameter of driving wheels	6 ft. 6 1/2 in.
" " Truck	3 ft. 1 1/2 in.
Weight in working order	128,970 lbs.
on truck	34,170 lbs.
" " drivers	68,140 lbs.
" " trailing wheels	28,860 lbs.
" of tender, full	87,510 lbs.
Capacity of tender, water	3,527 gals.
" " coal	13,227 lbs.
Total wheel base, engine and tender	48 ft. 7 1/2 in.

These engines are scheduled to haul a train weighing 485,000 lbs., exclusive of engine and tender, at an average speed of 56 miles an hour, over a very hilly country, and they are seldom behind time. The maximum grade is 1 per cent., and almost half the distance is composed of curves of a radius varying from 1,300 to 1,600 ft. For about 25 miles the road climbs up a 0.6 per cent. grade. Notwithstanding these trying conditions, the coal and water consumption is very satisfactory.

New Cement Plant of the Illinois Steel Company.

For three years past the Illinois Steel Company has been making hydraulic cement from blast furnace slag at the North Works, Chicago, and to meet the increased demands for this product a new cement plant is being built at South Chicago. The main building will be 150 ft. x 150 ft. and situated at the mouth of the Calumet River; there will also be engine, boiler and store houses, all the buildings covering an area 300 ft. x 500 ft. The plant will probably be built by August, when the daily capacity will be from 1,500 to 2,000 barrels of cement, and the making



An Atlantic Type Locomotive for German Uses.
Dimensions are in Millimeters.

width of the firebox has allowed a reduction in its length without decreasing the grate area required. This and the two fire doors enable the fireman to take better care of the fire than is usual. The fire doors are of the English, Webb, pattern, and are arranged so that but one at the time can be opened, a small pointer indicating automatically which one was last used. This arrangement for serving coal alternately through the right and left door has (according to Mr. von Borries) the effect of reducing the smoke nuisance considerably.

The upper circular portion of the fire-box is of larger diameter than the barrel, by means of which the full width of the barrel is made available for tubes. This construction permits also the presence

ber of such axles have been used for years on the Baden railroads without a single failure being yet recorded.

By having the driving gear between the frames the counterbalance can be considerably reduced. The valve chests are as accessible as with outside cylinders. The valves are of the American balance type. The motion is a combination of the Waldegg and the Joy valve gear.

Behind the main axle a large box is built in between the frames, opening up from the left side running board. Such parts of the machinery as are not accessible from the outside are inspected and oiled from this box, part of which work can be attended to, if necessary, while the engine is running.

of cement at the North Works will eventually be discontinued.

This cement is known as "Steel Portland," and because of its high tensile strength has been shown to be particularly suited for masonry and concrete foundations for buildings and bridges, retaining walls and river and harbor work, but it is not recommended as good material for sidewalks or work exposed to abrasion, especially where the atmosphere is dry.

The process of making this material is simple. The slag, as it comes from the blast furnace, flows into an open trough, which ends above a large tank of water. A nozzle under the trough directs a stream of cold water, under a pressure of about 80 lbs., against the falling slag, causing it to break up into small

granules. The chilled slag is then conveyed to rotary dryers, from which it passes into a hopper placed above a row of Griffin mills. In passing through these mills it is ground fine, and it is then raised to hoppers placed over a row of Davidsen tube mills. In the new plant there will be 20 tube mills. These consist of horizontal cylinders, lined with porcelain tile and containing about one-half their volume of selected flint pebbles about 2 in. in diameter. The slag, prepared lime and other ingredients are fed to the mill through a trunnion at one end, and after traveling the length of the cylinder are discharged at the opposite end. These mills make about 27 revolutions a minute, and the grinding and mixing are effected by the motion of the pebbles. The material discharged by the tube mills is the finished cement, and its fineness varies with the time of passing the last mill. This is under the control of the operator, and all material is required to be of such a fineness that 95 per cent. of it will pass through a standard sieve containing 40,000 meshes per square inch.

It is claimed that the objections to European slag cements, namely, irregularity and slowness of setting, do not apply to this product. The first difficulty is said to be largely due to the lack of uniformity of the slags from the low grade European ores. This is avoided by the Illinois Steel Company in using more pure and regular ores and by subjecting each lot of slag to chemical analysis before it is used. The slowness of setting is said to be overcome in the process of making and the results of many tests would seem to show that in this respect it compares very favorably with other cements.

A number of railroads are now using slag cement, and large quantities are being used in the new Government locks on Red River, near Plaquemine, La., and in the new sewer system at New Orleans.

Automatic Block Signals on the Southern Pacific at Los Angeles.

The Southern Pacific now has in use on its line in the city of Los Angeles, Cal., a number of automatic semaphore block signals worked by electric motors. These signals were made by the National Switch & Signal Co., of Easton, Pa., and the length of line equipped is about three miles, double track. The sig-

relays are on the signal posts in boxes of the usual construction.

The signals are of the standard semaphore pattern, placed about 1,600 ft. apart. The normal position of the signals is "stop."

The motor is that designed for the Lattig Automatic Electric Semaphore, the invention of Mr. J. W. Lattig, late Superintendent of Telegraph of the Lehigh Valley Railroad. Its arrangement on the post, and the connections to the track are shown in Fig. 4.

A Troublesome Bridge Failure.

The following account, from an officer of the road, gives a very modest description of a work which must have demanded energy and skill of a high order.

At 1 P. M. on Feb. 22, 1899, the center pier of the Allegheny Valley Railway bridge over the Kiskiminetas River, where it joins the Allegheny River, 28 miles north of Pittsburgh, on the River Division, was undermined by a heavy gorge of ice. The bridge was an iron Linville deck truss, of five spans of 142 ft. each, built in 1871 by Piper & Shiffler, a firm afterward merged in the Keystone Bridge Co., of Pittsburgh, now controlled by the Carnegie Steel Co., Limited. The piers were built in 1854, when the road was built. The second and third spans of the bridge fell with the pier, the rails and floor system being carried away by the ice, while the iron work of the trusses collapsed, imbedding themselves in the river bottom, 10 ft. below the surface of the water. The pier disappeared entirely. The base of the rail was about 55 ft. above the bed of the stream.

Trestling was commenced the same evening (Feb. 22). The last bent of the trestle was completed at noon on Wednesday, March 1, the floor and rails being laid and ready for testing at 6 P. M. of that day. Traffic was resumed March 2.

When it is considered that timbers 60 ft. long, and piling 70 ft. in length, had to be used in the construction of the trestle, and that the water was from 15 to 17 ft. in depth, and at times running very swiftly, the difficulties in the way of rapid construction will be apparent. The long timber required was furnished by the Alexander McClure Co., of Pittsburgh, the order being filled in four days. Meantime, while work was progressing on the

the north and sides of the stream, and the water in the Kiskiminetas being at the time of ample depth, an Ohio River steamboat was brought up from Pittsburgh and used for the transportation of passengers,

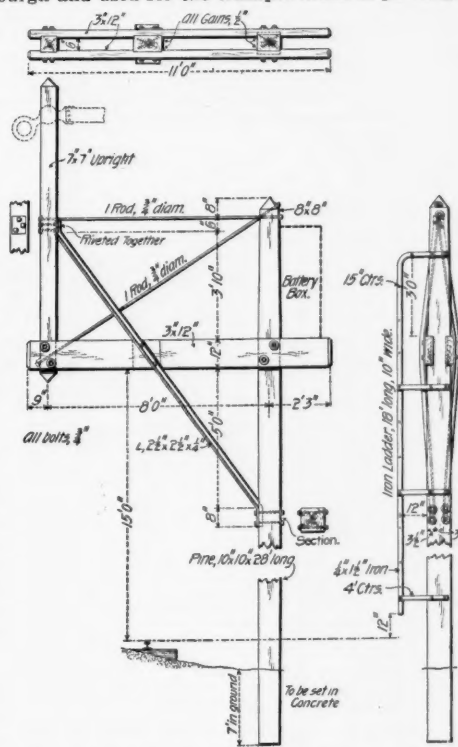


Fig. 3.—Signal Post for a Railroad in a Street.

baggage, express and mails until the loop was ready for operation.

Notes on the Trans-Siberian Railroad.

Mr. George Muschwek, a Bavarian railroad officer, contributes to the Journal of the German Railroad Union some interesting particulars concerning the Siberian Railroad. The work has been conducted

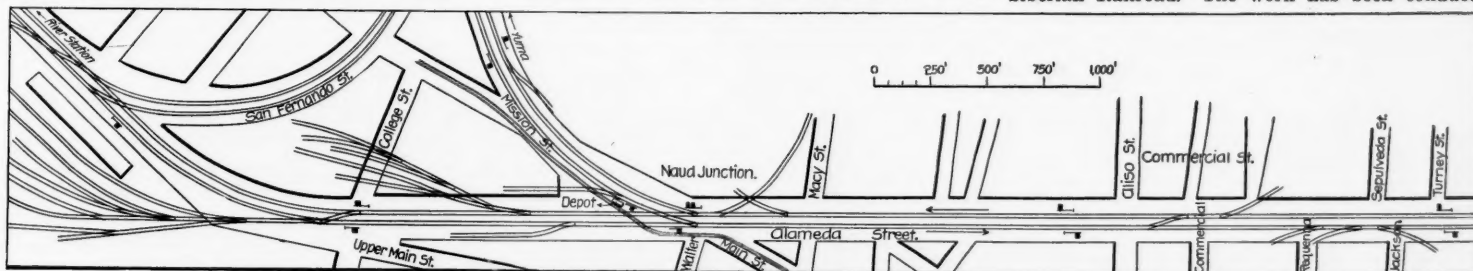


Fig. 1.—Automatic Signals on the Southern Pacific, Alameda Street, Los Angeles, Cal.

nals are controlled by rail circuits in the usual manner. Each signal is held in the stop position until the train which set it has passed through the block section and has cleared 300 ft. of track beyond the next signal.

The signals cover the line between Naud Junction and Clement Junction—a distance of about three miles, all in Alameda street. Fig. 1 shows about one mile of the road at the beginning. Side tracks like those in the vicinity of Jackson street, are numerous throughout the three miles. The track circuits at Clement Junction are shown in Fig. 2. Fig. 3 shows a special cantilever signal post which was found necessary for the reason that all the signals between Naud Junction and Clement Junction are in the street, which is

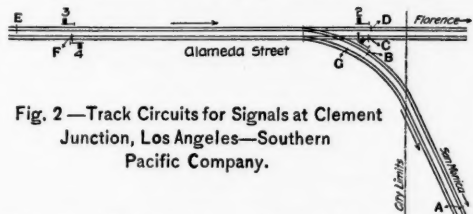


Fig. 2.—Track Circuits for Signals at Clement Junction, Los Angeles—Southern Pacific Company.

graded, curbed and, for the most of the distance, paved. Both curb lines are fully occupied by lines of poles belonging to electric lighting, electric power, telegraph and telephone companies. With the cantilever posts the semaphores and signal lights stand out over the street and in plain view clear of the electric poles and cross arms.

The main line batteries for operating the signal relays are of the gravity type. These batteries are placed in terra cotta battery chutes set in the ground, the top being level with the surface of the sidewalk. They are placed near the signal posts, and for convenience a rope, carried over a pulley attached to a temporary bracket on the signal post, is used to lift the battery cells out of the chute, when necessary.

Fifteen Edison-Lalande cells furnish current for running the signal motor. These cells are placed in a battery box attached to the signal post. Track batteries are placed between the rails, and the track

trestle, freight and passenger traffic was resumed early on Monday morning, Feb. 27, by means of the construction of two six-tenths (2.6) miles of new line along the north shore of the Kiskiminetas River, from Schenley to Gilpin, there connecting with a branch of the West Penn Division of the Pennsylvania Railroad, about three miles long, leading west-

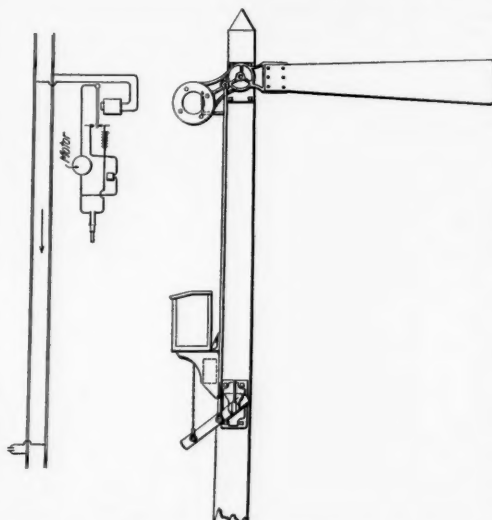


Fig. 4.—Arrangement of Electric Motor for Lattig Automatic Block Signal.

ward from Leechburg to the Gilpin coal mine. This branch connected with main track of the West Penn Division at Leechburg.

During the interim between the loss of the bridge and the completion of the loop, via Schenley and Leechburg to West Penn Junction, the passenger traffic was cared for by ferryage across the Kiskiminetas. Suitable approaches were cut down the bank to the water's edge, landings were built on

directly by government, without the mediation of contractors, except for special constructions, such as bridges, culverts, etc. The permanent laborers are chiefly from European Russia, and these are reinforced by natives of Siberia and gangs of convicts. The mechanics, such as masons, are chiefly Italians, Belgians and Poles; the track-laying is done by the railroad battalions of the army. In Eastern Siberia and Manchuria, Chinese coolies are employed. Definite information of the number of men employed is lacking, but there is said to have been 10,000 on the line west of Lake Baikal (on which the track is nearly all laid now), and 6,000 east of it. The engineers are all Russians.

So far as possible, materials are obtained from the country on the line. The ties (2,900 per mile) were found at no great distance, and also the great quantities of cement used. The rails are mostly from Russian and very largely from Siberian works, some of which have existed for a long time. A shipment of English rails was brought by way of the Arctic and up the Yenissei River, which crosses the road some 1,500 miles from the European border; but though it got through to its destination, no more shipments have been made by that route. [All the American rails bought have, we believe, gone to the Pacific terminus, Vladivostok.] The rails weigh 49½ lbs. per yard, and about 413,000 tons will be required to finish the road. Many streams are crossed, including some very large ones, and there are, or will be, more than 30 miles of bridges. Many of the streams are subject to overflow when the snow goes off in the spring, and in 1897 earthwork, where no track is yet laid, is said to have been damaged to the amount of \$3,000,000. The average distance between stations is 22 miles. As the road for long distances passes through regions almost treeless, special explorations have been made for coal mines, and some have been found, though not all near enough to the line to be available. The coal is said to be very good. The road is cheaply constructed, with steep grades and sharp curves, and does not admit of high speed.

(Continued on page 193.)



ESTABLISHED IN APRIL, 1856.
PUBLISHED EVERY FRIDAY,
At 32 Park Place, New York.

EDITORIAL ANNOUNCEMENTS.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussion of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially either for money or in consideration of advertising patronage.

The Fifty-fifth Congress having ended, the chance of getting Federal legislation on pooling of railroad earnings and the Interstate Commerce law is now gone until next December; and, according to the best judges, that is a mild way of stating the case; the prospect would be more accurately depicted if we said that no one could see much hope of getting Congress to do anything for the next two years. And in two years all sorts of changes of sentiment may occur, so that we may say that there is no prospect at all. Mr. C. A. Conant, the Washington correspondent of the New York Journal of Commerce, an accurate and impartial observer, says that most of the thoughtful members of Congress are convinced that the legalization of pooling would be advantageous to small shippers, and, therefore, would be favored by the majority of their constituents if only those constituents knew the true philosophy of the problem; but each Congressman is afraid that he cannot convince his constituency, and so continues to pursue a timid course. This timidity defeats wise legislation at the long sessions of Congress, because then an election is always near at hand; and at the short session the attempt to accomplish impossible things in more important legislation engrosses the attention of members and committees and the advocates of railroad legislation do not come to an agreement on what they wish to do until it is too late. Mr. Conant says that the committee of the National Board of Trade is getting up a bill to present to Congress, but he does not seem to think that the result of the committee's work will be any more satisfactory than have been the other recent attempts to formulate something that both the railroads and the Commission would agree to. The railroads seem to be pretty well united in opposing the grant of further power to the Commission, and the Commissioners appear to be as firm as ever in their insistence on the Cullom bill. They are willing to let the railroad interests try to get a pooling clause grafted to that bill, but that is as far as they will go.

Meantime people continue puzzled as to the why and wherefore of the present remarkable stability of trunk line rates, both passenger and freight, which has now continued eleven weeks. The general impression seems to be that the Interstate Commerce Commissioners have made an agreement of some kind with the railroad presidents, though the supporters of this theory, who must know that an agreement under such circumstances implies the granting of something by both parties, neglect to tell us anything definite concerning what the Commission can or will give to the railroads. The perplexed state of the public mind is well expressed by the Springfield Republican, which says:

The Interstate Commerce Commission has admitted its inability to enforce the law. The courts have robbed the Commission of much of its power. The railroads had proved too strong for the Commission to handle. They violated the law with perfect impunity. The Commission knew of the violations, but was helpless. Chairman Knapp recently stated that

the Pennsylvania and New York Central roads were able to pay dividends in 1898 only or largely because of a resort to illegal practices to take traffic away from the other trunk lines. This lawlessness went on under the eyes of the Commission which never lifted a hand to stop it. Now the Commission, finding that it cannot hold the roads up to the law by the power of duly constituted authority, is testing the power of loving counsel. The presidents were bending under the Supreme Court decision and were in a comparatively soft frame of mind; and all have promised to do their best to keep from violating the law. This plan of using persuasion instead of force upon law-breakers has much to commend it, no doubt; but if the authorities were to employ it upon the criminal classes generally there might be grumbling among law-abiding people. They might object to that manifestation of their united power which should go among thieves and cut-throats and say: "We cannot help your thieving and murdering if you are disposed to continue, but how much better to join us in observing the law." Whether the good intentions of the roads will last beyond the present season of unusually heavy traffic, remains to be seen. Meantime, does the union of the roads to keep up rates become any the less violative of the anti-trust act when helped on by an unauthorized body of Government officials?

We have no "inside knowledge" and we shall not attempt to explain the situation, but we will venture to suggest that the mystery may not be so very deep, after all. The Republican's theory is not the only one that will fit the facts. Possibly the counsel may have been "loving" while yet not so meek as is here supposed. No one has authorized the statement that there was an agreement. Perhaps the "counsel" was that of a loving schoolmaster who is gentle in his demeanor, but who has a rawhide under the desk. Indeed, a Western paper has definitely stated that Chairman Knapp showed the presidents a mass of evidence of rate cutting which he could let drop on them any day by touching a very small push-button. It is true that the Commission has failed in most of its prosecutions in the courts heretofore; but that does not prove that evidence will always be impossible to get. Moreover, a president might be amenable, in Mr. Knapp's office, to the force of evidence which would be too weak to satisfy a court. The Republican's simile of the Government official in a den of thieves is pretty writing, but if the results of Mr. Knapp's work continue as beneficial to the public and the railroads as they have thus far been, he will be entitled to the Scriptural commendation of him who "shall cover a multitude of sins."

The M. C. B. Journal Box Lid.

As the result of the discussion of journal box lids at the January meeting of the Central Railway Club, it was decided to refer this subject to the M. C. B. Association, with the recommendation that it be considered, with a view to altering the M. C. B. standard journal box and lid so as to make the front of the box dust proof. The discussion was based upon the committee report, made at the November meeting and published in our issue of Jan. 6, p. 6, which severely criticised the M. C. B. lid and favored a modification of the old Fletcher lid, but the report fails to say just what these proposed modifications are and whether this new form is patented. The discussion also throws no light on these points. While the committee strongly recommends the Fletcher type, Mr. A. M. Waitt described his experience with various forms of Fletcher lids as unsatisfactory in one way and another, and stated that he is now using a journal box and lid, the parts being interchangeable with the M. C. B. standard, which is quite satisfactory and superior to other lids which he has used. Parts of Mr. Waitt's discussion are given in another place and would seem to indicate that some difference of opinion might be brought out if it were attempted to greatly modify the present M. C. B. standards.

From the report and the discussion of members of this committee we infer that the lid which they advocate is intended especially for passenger cars on account of the machine work required to properly fit the flat surfaces which come in contact and the greater difficulty in opening and closing the box. If it is true that because of the cost and other features, evidently considered objectionable by some of those who took part in the discussion, the proposed lid is not well adapted for freight cars, we hardly see why the present M. C. B. standards should be changed as recommended by the committee, or how such changes would result in anything further than to increase the number of lids which would not fit the present boxes. It would seem to make little difference what individual roads decide to use for passenger equipment, as such cars are, with few exceptions, always on the home roads, and there is now little uniformity in matters of detail. Possibly we have entirely missed the intention of this recommendation, which is by no means clear.

There are now journal boxes and lids of the M. C. B. type suitable for freight cars, which are probably as nearly dust proof at the front end as it is

possible to make for the price which railroads are willing to pay, and it is questionable whether it is worth while to go to great pains to make the front of the box perfectly tight and at the same time leave an opening at the rear for dust to enter. It would seem that more could be accomplished by improving the dust guard. Against this a bad piece of theory has been urged: That if the front of the box were perfectly tight there would be no air currents through the box and, consequently, no dust would enter, even if the dust guard were imperfect. Certainly a very peculiar theory and one which, so far as we know, has never been demonstrated.

The Taxation of Franchises.

Senator Ford, of the New York Legislature, has introduced a bill which has attracted a great deal of attention, and, at the public hearings before the committee on taxation and retrenchment, has developed a wide difference of opinion as to its merits. The proposal of Senator Ford has been very generally announced as a new departure in taxation, and perhaps this accounts for a good deal of the interest generally excited in its behalf. But the form of the bill takes the familiar guise of an amendment to a law which has been in force for many years. It proposes merely to amend the definition of the terms, "land," "real estate" and "real property," as used in the tax law, so as to make these expressions include "the value of all franchises, rights or permission to construct, maintain or operate all surface, underground or elevated railroads in, under, above, on, across or through streets, highways or public places," and also "the value of all franchises, rights, authority or permission to construct, maintain or operate in, under, above, upon, across or through any streets, highways or public places, any mains, pipes, tanks, conduits, or wires with their appurtenances, for conducting water, steam, heat, light, power, gas, oil or other substance, or electricity for telegraphic, telephonic or other purposes."

The law, as it stands at present, defines as "real estate," "all surface, underground and elevated railroads," and "all mains, pipes and tanks placed upon, above or under any street or place for conducting steam, heat, water, oil, or any property, substance or product, capable of transportation, or conveyance therein, or that is protected thereby." The amendment consists in extending the definition of "land" so as to include, not only the tangible property at present comprehended in the term, but also the intangible, variable and subtle value of the right to use it. If the bill becomes a law, not only will this species of tangible property be taxed at its full assumed value, but also the right to enjoy it. It will be as if one were taxed on his house and then taxed also on the value of the right to live in it, or otherwise use it. There may be reasons why this policy should be pursued, but it is well in the outset to understand clearly what the policy is.

Under the present law a corporation operating such property as that above mentioned is taxed in divers ways. First there is a state tax known as an organization tax, imposed as a condition to incorporation. This is one-eighth of one per cent. on the whole capital stock. Then all real estate of such a corporation is taxed, as that owned by a natural person. In the next place it must pay an annual tax on its capital stock, less such part of it as is invested in real estate and the shares of other corporations taxable upon their capital stock; also upon its surplus profits exceeding ten per cent. of its capital. Then it must pay a further state annual tax at the rate of one-quarter of a mill for each one per centum of dividends declared upon its capital stock if amounting to six or more than six per centum on the par value of the capital stock, or if less, or no dividends, at the rate of one and one-half mills upon each dollar of the capital stock. Nor is this all. Certain of such corporations operating steam railroads must pay for the privilege of exercising their corporate franchises an annual tax amounting to five-tenths of one per centum upon the gross earnings, while other transmission corporations are annually taxed at the rate of five-tenths of one per cent. upon their gross earnings, and three per cent. upon the amount of dividends declared in excess of four per cent. of the capital. Where municipal franchises are auctioned off to the highest bidder, there is in addition to all these taxes a further annual tax to the municipality for the local privileges so acquired, calculated upon gross earnings or otherwise, as the case may be.

We do not understand that Senator Ford proposes to modify or remove any of these taxes, but rather to pile Pelion on Ossa. In addition to its

tax upon tangible real estate in the ordinary sense and its personal property through its capital and surplus, and its franchise dividend state tax, and its franchise gross earning state tax, and its franchise municipal tax, Senator Ford's bill imposes upon this class of corporations a further tax upon the value of the franchise they exercise, which, while considered as real estate, is apart from it, and cannot be deducted, as ordinary real estate must be, from the capital stock.

It seems to be obvious that this system of taxation, in multiplying the occasion by the opportunity, is not only complicated and confusing in its result, but, in doubling and redoubling taxation upon the same subject, is having a mischievous effect upon corporate enterprises in the state. The intricacy of the system indeed serves one malign purpose. It disguises the inherent vice of inequality, and by appealing to a low popular prejudice against corporations, and so obliterating the common inclination of people generally to be fair, perpetuates the disposition and develops the opportunity for practical confiscation. It is a crime against the welfare of any people to devise any other than a clear, simple, equal and uniform system of taxation. If it be not clear and simple, it is not apt to be equal and uniform. Those who seek to overthrow equality and uniformity of public burden, first involve the public mind in a maze of doubt and intricacy, so that the baleful effect of their designs may be lost sight of in the complication of executing them. Unequal taxation not only derives capital from the state, but far worse than that, it demoralizes and degrades the people. No man will be taxed to death if he can avoid it. If he cannot escape the realm, he will resort to every device that necessity can invent to keep that from being taken unjustly from him which sustains his life. Confiscation, under the mask of taxation, blights the industry and enterprise of any people. Those who have little, get to have less, and those who have nothing, since their labor is no longer demanded, sink into pauperism.

If, as a people, we are content to go on with the habit of appropriating recklessly and wastefully enormous sums of money to all sorts of schemes and ventures, we should at least rise equal to the occasion and devise an adequate and sensible method of meeting the obligations from extravagance. It cannot be done by heaping all or most of the burden on one class of our citizenship, even though that class be a small minority, and so incapable of resisting the injustice. It cannot be done by annual legislative tinkering upon a patchwork of bad laws, making them more intolerable with each passing year. It can only be done by an intelligent inquiry, in the spirit of fair dealing, as to all property available for taxation, and the promulgation of a law based upon the result, taxing all such property equally and uniformly.

Instead of raking over the field already exhausted, Senator Ford will find much better results for all concerned by extending his labors to other ground more productive and worthy of cultivation. Let him bring in a bill sweeping away the present antiquated, cumbrous and much patched, incongruous system, and substituting in its stead a simple plan in consonance with modern economic development, justified by and founded upon the experience of the most advanced and enlightened nations, and above all characterized by equality and uniformity. Such a bill may perhaps not be approved by those who have the greatest reason to pray for its passage, and doubtless we have not yet reached that point in civilization where such a measure can reasonably be expected to become a law. But we all owe something to the country, and one good honest effort to push the people a little further on from confiscation toward enlightened taxation, though unsuccessful, is educational. We recommend to Senator Ford to make this contribution to his country's welfare. It will blaze the way for some one else after him, or at least mark the record of some progress in the world's history of taxation.

Inspection of Automatic Block Signals.

We mean inspection in its narrowest sense, not including adjustment, maintenance or repairs; and we shall further limit our consideration of the subject mainly to inspection of the working of signals—to seeing whether or not in each operation of a signal it moves as it was intended to move.

As every one knows, the inspection is the crucial point in the successful operation of automatic block signals. The duty required of a block signal is of the highest importance; a failure may at any time mean disaster. We try to throw part of the responsibility on a brakeman with a lantern, and we

comfort ourselves with the reflection that men make blunders, and that, therefore, it is possible to set the standard for our mechanical appliance too high; but yet every one wants to make his block signals perfect, and this demands frequent inspection by thoroughly qualified men. The fact that good service may be had without making this inspection continuous may be said to be the reason for the existence of the automatic signal. If the cost of the inspection, added to the cost of the delicate apparatus, should rise to a point near that of the wages of signalmen, the abandonment of automatic apparatus would at once suggest itself.

This question of inspection came up at the recent meeting of the signal engineers at Philadelphia, and it is touched upon by Mr. Blodgett in his remarks published in this issue of the Railroad Gazette. The feature which we now have in mind, as already intimated, is that of who shall be responsible for detecting the failure of a signal to change from the "all clear" to the contrary indication when a train enters the block which the signal controls. On one side, it was asserted at the meeting that the engineman should know, by the evidence of his own eyes, that each signal changes as he passes it. This is possible, at least in clear weather, with nearly or quite all the disk signals now in use, the signal post being set two or three hundred feet in advance of the point where the engine shunts the track circuit. On the other hand, the advocates of the plan in vogue on the Pennsylvania strongly disapprove the practice under which a signal turns to red right in the face of the engineman. The pneumatic semaphores on the Pennsylvania change immediately after the passage of the engine, instead of immediately before. This is the normal way, and should be the rule with all signals. An engineman ordinarily wants to see a signal change to the clear position; but with the automatic disk he has to reverse his mental habit, and see it change from instead of to that position.

But the Pennsylvania people have to admit that their only assurance that their signal is in good working order is that based on the perfection of the apparatus and the frequency and skill of the inspection made by the signal department's men. But, of course, no one will claim absolute perfection for these, and so there must be one more safeguard—the flagman. Every road ostensibly continues to depend on the rear brakeman, as we may see by reading the biggest and blackest type that can be found in their block signal rules; but those which make the signal turn in the face of the engineman doubtless feel, in fact, much less dependent upon him, than those on which the engineman cannot check the operations of the signal. This must be the case, unless the latter have very efficient signals, and the former very inefficient. A road with an incompetent signal superintendent could feel little confidence even with the engineman's inspection; while the long and excellent record of the pneumatic signals on the Pennsylvania affords presumptive evidence that good service may be had without enginemen's inspection.

Still, every railroad officer responsible for signals desires perfection in all his appliances, and both the plans here referred to obviously fall short of this. The signal which turns to danger in face of the engineman may be thus turned in consequence of the misplacement of a switch or of a train entering the section from a side track, or from the other end. In case of a dense fog the signal may turn before the engineman sees it, as was pointed out by Mr. Wilson at Philadelphia, and thus raise a doubt whether it was not set by a previous train. The signal which changes after the engine passes may fail, and no one notice the failure. Then the dependence is upon the rear brakeman; but one of the plainest facts of recent experience is that American brakemen are constantly growing more and more confirmed in the habit of depending on block signals, and therefore in the habit of neglecting to fully protect their trains by flag. In spite of added vigilance on the part of the superintendent, this tendency seems likely to continue, if not to increase. The experience of English railroads teaches us that it probably will go on until the flagging rules shall be practically worthless. Over there this is acknowledged, and not even the finical Board of Trade inspectors require the enforcement of the flagging rules. It will always be uphill work to make men perform a disagreeable duty which they believe to be unnecessary. To accomplish even fair success we must either convince the men that the thing is necessary, or else make it so convenient and easy to perform that they will do it without regard to its necessity.

There is a simple way of accomplishing this; of so changing the brakeman's duty that he can perform it under regular conditions (instead of having

constantly to adjust himself to varying conditions, as is necessary when we depend, even partially, on the time interval); and, moreover, so that his faithfulness can be much more readily tested by his superior. It is to have the brakeman see that each signal stands in the "stop" position when he passes it. Thus, instead of preventing collisions due to failure of the signal, he can prevent the failure itself. If the signal does not change he can stop his train at once and go and make it change.

With perfect signals the Pennsylvania arrangement is ideal. With brakemen's inspection the lack of perfection is provided against in the most rational manner possible. The proposition to put this new duty on the brakeman has been discussed but very little by the signalmen in their conventions; signal engineers are naturally slow to offer advice to superintendents, especially where they might seem to be asking for something calculated to relieve them of a part of their own responsibility. But they might, with perfect propriety, not only suggest, but urge, this or any proposition to have signals more closely inspected, on the same ground that an honest cashier advocates frequent examinations of his accounts by the auditor.

To many superintendents it will at once occur that there is a weakness in this proposition, due to the fact that signals would fail so rarely that a brakeman who forgot to look at a signal and who was disposed to falsely report that he did see it, would feel safe in doing so; but the signal engineer could readily enable the superintendent to check that kind of lying. A few signals secretly held at "all clear" now and then would, with proper discipline, serve to keep the brakemen alert.

The advantages of this brakemen's check would outweigh worse weaknesses than this, if such existed. It would make it feasible to place all stop signals exactly at the stopping point, thus eliminating the inconsistency involved in putting them in advance of it. It would get brakemen into the habit of knowing that they were protected from following trains, and thus make the automatic block system as complete a safeguard as the non-automatic. It is strongly argued (and we are not controverting the argument) that, in view of the limitations of human nature in the operators, the automatic is already as reliable as the manual; but the difference, with brakemen's inspection, would be that there would be something like logical proof available to support the argument. At present the comparison between the two is wholly a comparison of the relative chances of an error by the men or by the machines, and this can be settled by experience only after twenty, thirty or fifty years' trial. With a record of the movements of every signal a mathematical comparison could be made.

Our readers will recollect that on the Atchison, Topeka & Santa Fe, rear brakemen of passenger trains have for some months kept records of signals; not automatic signals, however. A daily written record is made by the brakeman, showing each signal passed by his train. Officers of the road express satisfaction with this arrangement. A brakeman looking back sees only the back side of a signal, and although he knows that it indicates "stop" he does not know how long it has been in that position. If the engineman is duly attentive to his duties, this is all that need be required of the brakeman; but if it be deemed necessary or desirable to have the brakeman see an automatic signal move, there would probably be little difficulty in having a man in a car about 500 ft. back of the engine, observe the signal before it came to rest (from its front side.) At all events, the experiment would be well worth trying.

Annual Reports.

Missouri Pacific.—The annual report for the year ending Dec. 31 last, issued this week, gives the record of the second year of recovery from the depression which set in five years ago, and shows material increases in gross earnings and traffic carried. These figures, as well as net earnings, are higher than ever before reported, but the gain in net income has not shown anything like the same relative improvement as gross, this being due to the improvement work undertaken, the cost of which has been charged to expenses. Not including new equipment purchased, a large part of the cost of which was provided out of the year's income, \$850,000 of the expenses of 1898 were for extraordinary improvements, properly chargeable to capital account. Under this policy the increase in net earnings is reduced to \$221,000, although gross receipts are nearly \$2,000,000 above the 1897 figure.

The changes of one year, however, gave little indication of the extent of the recovery in revenues. In the last two years the Missouri Pacific has gained \$4,732,900 in gross income, with an increase in expenses of \$2,681,200, and net earnings are higher by

\$2,052,000. The increase in surplus is \$2,442,000, but President Gould intimates that a dividend is not to be looked for in the immediate future, the surplus being held as available for further improvement work. The consolidated income account for the last two years follows:

	1898.	1897.	Inc.
Freight earnings	\$19,183,899	\$18,119,311	\$1,064,588
Passenger earnings	4,699,178	3,999,843	699,335
Total gross earnings	26,744,822	24,805,451	1,939,371
Operating expenses	19,172,568	17,454,112	1,718,456
Net earnings	\$7,572,254	\$7,351,339	\$220,915
Per cent. exp. to earn.:			
Total net income	\$8,407,690	\$8,177,612	\$230,078
Bond interest	5,346,195	5,437,283	*\$91,088
Rentals and taxes	1,410,827	1,408,899	1,928
Sundry accounts	470,778	836,303	365,525
Balance	1,179,899	495,121	684,778

*Decrease.

About half of the increase in expenses in 1898 was due to maintenance charges, the same accounts having absorbed a somewhat larger proportion of the increase in 1897 (\$570,000 out of \$963,000). Maintenance of way charges increased \$455,000, but this follows a decrease of \$246,000 in 1897. The higher cost of maintenance of way was chiefly due to laying new rails, the cost of the rails and fastenings being \$329,000 and labor \$125,000. Over 200 miles of road was relaid with 75-lb. rails. Other work included building 29 miles of second track, 65 miles of ballasting and laying 2,190,000 cross ties at a cost of \$877,000, while replacing wooden bridges with steel structures was continued. An important work, still in progress, is the reduction of grades in the Iron Mountain to a maximum of $\frac{1}{2}$ of 1 per cent.

The increase in tonnage has about 11 per cent. and rates were maintained, though a decrease in bulk grain and live stock and an increase in merchandise and other high class freights partly accounts for this. The loss in grain traffic is attributed to the sharp competition and low rates of the lines east of the Mississippi River, which succeeded in drawing grain to the Atlantic ports at the expense of those on the Gulf. The leading traffic statistics are appended:

	1898.	1897.	Inc.
Tons carried	9,431,700	8,438,700	993,000
Ton-mileage	2,272,800	2,150,160	122,640
Av. train load (tons)	195	194	1
Av. car load (tons)	12.5	12.2	.3
Av. haul (miles)	241	255	*14
Train mile earnings	\$1.76	\$1.75	¢.01
Ton mile rate	c. 841	c. 843	c. 001

Omaha.—The annual report of the Chicago, St. Paul, Minneapolis & Omaha, for the year ending Dec. 31 last, shows a gain of nearly \$1,000,000 in gross earnings and of \$584,000 net, the balance over all charges being nearly \$2,000,000, which would have provided 6 per cent. on the company's common stock after deducting the 7 per cent. preferred dividend. The dividend paid on the common was $3\frac{1}{2}$ per cent. The details of the income account for the last two years follow:

	1898.	1897.	Inc.
Gross earnings	\$9,590,993	\$8,652,793	\$938,200
Operating expenses	6,091,563	5,737,447	354,116
Net earnings	\$3,499,430	\$2,915,346	\$584,084
Interest and rentals	1,606,375	1,526,096	*\$80,279
Net income	\$1,893,055	\$1,389,250	\$503,805
Dividends	1,437,261	1,158,970	278,291
Improvements	420,173	—	420,173
Balance	\$136,621	\$230,281	*\$93,660

*Decrease.

The increase in freight earnings in 1898 was \$546,995, or 8.4 per cent., and in passenger receipts \$361,300, or 22 per cent.

The statistics of traffic movement, naturally show great growth in both tonnage and passenger business, but the larger business was only secured at the cost of rates, the ton-mile rate last year falling below one cent for the first time and the passenger mile rate being reduced to 2.325 cents. The changes in the traffic movement are of considerable interest and are shown below for a series of years:

	Ton-miles.	Pass.-miles.	Ton-mile rate.
1898.....	731,347,500	86,063,400	c 0.967
1897.....	647,846,800	66,776,400	c 1.007
1896.....	574,145,400	71,277,700	c 1.042
1895.....	466,646,800	69,425,300	c 1.150
1894.....	458,563,100	67,219,200	c 1.137
1893.....	524,073,400	86,621,400	c 1.124
1892.....	604,760,600	84,811,400	c 1.106

The average freight train load has increased 55 tons since 1892, from 164 tons to 219 tons last year, the train load in 1894 having been reported as 147 tons. The freight train-mile earnings have been pretty steadily improving, despite the decline in the ton-mile rate, being reported as \$2.12 in 1898 against \$1.88 in 1897 and \$1.82 in 1892.

One feature of the expense account has been the steady growth of the maintenance accounts with the cost of conducting transportation remaining practically unchanged, despite the large growth of traffic. The average expenses of maintenance of way in 1898 was over \$1,000 per mile of road. Besides the heavy charges to expenses last year for maintenance work, the company set aside out of its surplus earnings \$420,173 for carrying out changes in alignment, grades and additions to the property. In 1897 extraordinary charges of \$442,700, representing a special equipment renewal fund of \$242,700 and \$200,000 for new car building had been included in equipment expenses.

Multiplex Telegraphs.

The very ingenious device of Professor Rowland, of Johns Hopkins University, for sending six or eight telegrams over one wire simultaneously was briefly referred to in the Railroad Gazette last week, page 158. Nothing is given out by the inventors as to the cost of this apparatus, or the magnitude of the difficulties of detail that are yet to be overcome; but it is announced that a two-million-dollar company is to be formed, which seems to indicate that capitalists have confidence in the invention.

In view of the persistent arguments that have been made in some quarters concerning the value of the multiplex principle to usual railroad service. So far as can be judged by what Dr. Rowland has thus far told the public concerning his new apparatus, its chief advantage over previous "rapid" methods of telegraphing is in printing the messages; for mere rapidity—that is, economy of time in the use of a wire—the Wheatstone and other well-known devices which have been before the world for 20 years or more, appear still to have as good a standing as ever. Dr. Rowland seems to be accomplishing results similar to those accomplished by his predecessors, only by different means. The first question is, whether the difference is sufficiently large to constitute an important advantage; for a small advantage, however interesting it might be to a large telegraph company, can hardly be said to merit much attention from railroad companies. But a more fundamental question is: Do the railroads want "rapid" telegraph machinery at all; and if they do, to what extent?

There are, of course, a great many telegraph printers, the original House and the improvement on it, the Stock Exchange ticker, and so on, but none of them are in use on railroads, so far as we are aware. There are a number of multiplex devices for telegraphing which are in use on railroads to some extent, namely, the duplex, the quadruplex and the phonoplex, but all of these are used with the ordinary Morse code, and none of them are printing telegraphs. There are also multiplex printing telegraphs, but none of them have been practical successes. Of course, if the multiplex printers can be made to do practical work, with simple and cheap apparatus, they may have great value for the telegraph companies and for the few largest railroads. But on the "average" railroad the Morse is probably destined to hold sway for a long time to come.

When a railroad is built nowadays, say, 100 miles long, through a thinly settled country, it will probably be equipped with a single telegraph wire, either owned by the railroad company or leased from a telegraph company. This single wire is "cut in" to all the offices along the line, of which we may say there will be ten or twenty, and it will be operated by the Morse system, which means that in each office there will be a relay connected with a sounder, all telegraph operators being now trained to receive by sound. A message sent from any one of the offices will be heard at the same time in all the others, though ordinarily only two operators out of the ten or twenty can utilize it at the same time.

It does not seem likely that any printing telegraph will ever get into ordinary use on such a wire as this. In the first place, no railroad would stand the waste of paper involved in having all messages sent over this wire printed at all the stations. This would mean that the printing device should be thrown out of circuit at each station until it was called up on the wire. The inventors of the printers would undoubtedly seek to overcome this by some selective device, which would enable the sending operators to cut in the printer at any desired office. Possibly some practical scheme might be devised for this, but its value is problematical.

As the business of the railroad gets heavier, a second wire will have to be strung, which will also be "cut in" to every office, and be known as the message wire. Here, one might say, would be an opportunity for the multiplex inventors to step forward and save every weak railroad the expense of a second wire; but, unfortunately, the multiplex inventions thus far used do not fill the bill. The duplex and quadruplex allow one intermediate office between terminals, or possibly two, the phonoplex perhaps one or two more, but none of them will take in the ten or twenty offices on our hypothetical railroad, and the superintendent is obliged to squeeze out the money for a new wire.

The peculiarity of railroad telegraphs, as compared with commercial, is the very small proportion of lines on which the business demands more than two wires, or, at the outside, two wires duplexed. This proportion being small, the introduction of any new apparatus, or anything demanding specially trained operators, would necessitate an important change in the management of the personnel, which to most railroad officers would probably seem undesirable unless accompanied by important advantages. There would need to be a good deal of expert supervision for a small number of units of work accomplished.

The crowning merit of the ordinary Morse telegraph

is its simplicity, and, as railroad telegraphs must cover a great deal of territory for a very little money, simplicity is to the railroad manager a very attractive feature. On the railroad the "way wire" is universal, and the wire which is wholly used for through business is rare. Any one who would increase the variety or complexity either of machinery or personnel, will probably have to find his field in some branch other than the railroad branch of the telegraph business, however meritorious his invention.

The Canals of the State of New York.

The Governor of the State of New York has appointed a special commission to act with the Superintendent of Public Works and the State Engineer and form a joint board to investigate the broad question of the policy of the State of New York toward its canals. The gentlemen whom he has named are Gen. F. V. Greene and Mr. Frank S. Witherbee, of New York; Major T. W. Symonds, Corps of Engineers, U. S. A., now stationed at Buffalo; Mr. John N. Schatcherd, of Buffalo, and Mr. George E. Green, of Binghamton. Gen. Greene is an engineer, is a man of unusual force and ability, and has had large experience in business affairs. Major Symonds is also another highly trained engineer and has made special studies of the New York canal question for some years, and has written the best report on the subject that we have ever seen. The other gentlemen named on the commission are serious and successful business men and men of high repute. In asking these gentlemen to serve on this commission the Governor said:

"I am very desirous of seeing the canal policy of the State definitely formulated. As you know, the \$9,000,000 designed to deepen the canals to the depth of nine feet, has been practically expended, and it is reported that \$16,000,000 additional will be needed to carry this scheme through, while, at the same time, certain experts have said that the scheme, when carried through, will not be satisfactory. In short, there is much conflict of opinion as to what policy should be followed with reference to the canals, and even as to the proper terminus of the canal on the lakes.

"I desire the opinion of a body of experts, who shall include in their number not merely high-class engineers, but men of business, and especially men who have made a study of the problems of transportation, who know the relative advantages and disadvantages of ship canals, barge canals and ordinary shallow canals, who are acquainted with the history of canal transportation as affected by the competition of railroads, and who have the knowledge that will enable us to profit by the experience of other countries in these matters. I have decided to ask five of the citizens of New York, whose reputation stands highest in these respects, to act with the Superintendent of Public Works and the State Engineer and Surveyor, to make the necessary investigations, and where necessary to call in the aid of special experts, to enable them to report to me, at as early a day as convenient, the proper course we should follow as regards this vital interest of the State of New York.

"Last year the questions which arose affecting the canals were really twofold in character, namely, those affecting the actual administration of the canals, and those affecting the general canal scheme by the State. As regards the former, the questions are now well on their way to solution. Three of the best qualified lawyers in the State have been retained to investigate and press home any charge of corruption against any canal official which in their judgment can be sustained, and Col. Partridge is so administering the office of Superintendent of Public Works as to guarantee the honest, efficient and economical management of the canals as they now are. The broad question of the proper policy which the State should pursue in canal matters remains unsolved, and I ask you to help me reach the proper solution."

This strikes us as one of those clear-headed and energetic performances for which Governor Roosevelt has become famous. He has grasped the situation without any delusions and has taken the sensible way of discovering the settlement of the great difficulties which it presents. Of course, he has already stirred up criticism, and he has unnecessarily put himself in a place where he is likely to have to decide something—a situation which no mere politician ever courts. Already there are those who are saying in the newspapers that the suggestion of a possible change of plan toward the canals is disloyal to the State of New York. One prominent man says: "Nothing can be more harmful to the commercial interests of New York than the suggestion that perhaps the time has come to change the policy of the State with regard to its canals." This is obvious nonsense. The policy of the State toward its canals must be changed. Times have changed and methods of transportation have changed. The policy of the State toward its canals for a good many years has been wasteful of energy and opportunity. It is impossible to get the value of the present canals under the present system of working them, but further, it is also impossible that small boat canals, under the most successful system of operation, can compete with the railroads.

We need not undertake to demonstrate these propositions now; they have been demonstrated over and over again, and we assume that the burden of proof is on the man who says that they are not so.

Obviously, the Governor has decided to stop the waste of the people's money on the canals of the State just as soon as he can. It does not, however, follow by any means that this means the abandonment of the canals. It may mean their enlargement, both in main prism and in the locks, and the establishment of modern terminals and the abolition of the absurd laws restricting the employment of capital in operating these canals, and, finally, their very

economical and efficient use by fleets of barges of large capacity. All of this may speedily be brought about as a result of the Governor's action. We do not pretend to guess whether it will or will not be brought about, but it is among the possibilities.

The amendment to the Railway regulation act, recently presented in the English Parliament by Mr. Ritchie, President of the Board of Trade (Railroad Gazette, p. 174) deals not only with power brakes for locomotives, both passenger and freight, and with automatic couplers for both passenger and freight cars, but also with several other features of train equipment. (It will be remembered that the whole bill is designed to empower, but not to require the Board of Trade to issue compulsory orders). One clause provides for hand brakes on both sides of freight wagons, so that men need not pass between the ends of the wagons to apply or release them. Another requires labels on both sides of freight cars, or labels so fixed that they can be seen from either side, so as to obviate the necessity of men passing between the ends of the wagons to examine the labels. Section 5 extends the power of the Board of Trade in the matter of requiring an electric or other bell-cord on passenger trains, making this power practically universal. At present this law does not apply to trains which do not travel more than 20 miles without stopping. The Board cannot order couplers under five years, but may order brakes and labels in two years. The Board may approve issues of new shares of stock to provide funds for improvements made under this law. Orders of the Board are to be enforced by application to the Railway and Canal Commission, the same as in the case of orders in other matters in which the Commission has authority. Coal merchants and others owning cars are already opposing this bill. A meeting of these private-car owners was held in Birmingham March 2, and resolutions were unanimously passed declaring that the proposed law would unduly harass the colliers, iron merchants and others. The presiding officer, Mr. Downs, said that Mr. Ritchie was wrong in asserting that men have to go between cars to uncouple. He might have added, what no one seems to recognize, that going between cars when they are at rest, which is the worst condition to be met in English practice, is quite different from going between them at the moment when one of the cars is to bump against the other, which was the chief danger that had to be dealt with in this country.

Notes on the Trans-Siberian Railroad.

(Continued from page 189)

The fastest train at present (once a fortnight) runs 17½ miles an hour, the ordinary trains 12¼.

The most costly part of the road will be that forming a semi-circle around the south end of Lake Baikal, from the present terminus at Irkutsk. The latter city is on the River Angara, the outlet of the lake, 42 miles from the lake, and about 400 ft. below it. Nothing has been done on the railroad around the lake (195 miles) except surveys and plans, but a great deal on the line east of the lake, with which connection is to be made for the present by a road 42 miles long from Irkutsk to the lake shore and a car-ferry across the lake. A very powerful ice-breaker is being built for this ferry. The lake is usually navigable about seven months in the year, and by means of the ice-breaker it is hoped to cross it about three months more, and it is possible that a track may be laid across the ice the other two months, though the lake is 37 miles wide there. The ferry plant will cost more than \$1,500,000.

The line east of the lake to the Amoor Valley, 683 miles, is called the Trans-Baikal Railroad. Work has been prosecuted on it since 1895, and it is to be completed this year, at least as far as the River Onon, 563 miles from Lake Baikal, where the Chinese Eastern Railroad begins. The construction of a railroad down the Amoor Valley, 1,332 miles, which was the plan before the right to build through Manchuria had been secured, seems definitely abandoned. Little had been done on it except some preliminary surveys. Steamboats navigate the stream in summer, and regular lines of sleighs run over the ice in winter.

The whole length of the line from Cheljabinsk, near the European border, through Manchuria to Vladivostok, including the circuit of Lake Baikal, will be 4,120 miles, and Cheljabinsk is 2,225 miles from the line between Russia and Germany, and about 3,000 miles from the English Channel.

That the Siberian Railroad is not through such a new and uninhabited country as that through which the Union and Central Pacific Railroads were built some 30 years ago, may be gathered from the population of some of the towns on the line. Petropaulosk, 325 miles from the western terminus, has 20,000 inhabitants; Omsk, 180 miles further east, 40,000; Maryinsk, 13,000; Tomsk (on a branch), 50,000; Krasnojarsk, 15,000; Irkutsk, 60,000. The line as far as Irkutsk is 2,022 miles long. Beyond Irkutsk on the

original route there can scarcely be said to be any towns; but most of this route seems to be definitely given up, and the Chinese Eastern Railroad, which takes its place, will pass Kirin (150,000 inhabitants), and other towns. Vladivostok, the Pacific terminus, is credited with 15,000.

Prompt Collection of Freight Bills.

The local freight agents of Wheeling, W. Va., have lately made a noticeable reform in their method of collecting bills. The conditions there had got into bad shape (as they have in many other cities). In Wheeling, as everywhere else, the prices at which freight bills are made out are based on the assumption that payment will be made when the goods are delivered; but, as in other cases, competition had crowded out correct principles, and a moderate use of credit had grown to be such an abuse that many consignees regarded it as their legal right rather than an accommodation. Each road knew it was being imposed on, but being distrustful of competitors and fearing to incur the displeasure of the public, nothing was done. Each felt powerless, and continued to suffer.

The local agents representing the nine different railroads doing business in Wheeling are organized into a local association, which is a member of the National Association of Terminal Local Agents. They have before now cured abuses worse than the credit system. They effectually apply demurrage and storage rules, and have adopted uniform hours for opening and closing stations, they handling "order" shipments under uniform rules, and have won the approval of their patrons. The agents have confidence in each other, the result of contact and experience, and each seems to be thoroughly backed up by his superiors, so that there is an effectual unity of purpose.

Prior to the first of July, 1898, consignees and railroads alike suffered from the vicious credit system. Each agent employed one or more collectors, who presented bills to four-fifths of the shipping public, some daily, others semi-weekly, and still others weekly. These collectors met all sorts of rebuffs. Some customers were too busy to attend to such a caller; others said "no funds to-day"; others "paymaster not in"; still others would refuse to pay, claiming unjust charges or insisting on the allowance of a claim. Delays were frequent at every place, waiting for bills to be checked up. Many times the collector would be put off with any excuse to gain time, and every failure meant an erasure on the cash book, with consequent confusion of accounts. The abuses finally exceeded all reasonable limits; though we do not mean by this that Wheeling was worse than other cities in these respects. Every agent can testify to more or less of the same experience.

After a careful discussion of the matter at a number of meetings, the agents concluded to go back to first principles and assert that all bills were payable at the railroad office. It was accordingly announced that on the date above mentioned the collectors would be dispensed with, and all bills for freight would be payable at the cashier's window. Only to a few larger shippers or those receiving many carloads of freight, which would be expensive to hold for charges, was a week's credit extended. A few wholesale men owning private tracks were permitted to settle once a day, but all others on delivery of freight. All bills were to be payable at the station, those having a weekly credit to remit by mail or messenger. The penalty for a failure to settle according to the regulation should be the forfeiture of the privilege enjoyed. Six reputable firms, failing to appreciate that the roads "meant business," were simultaneously placed on the "pay on delivery list" by all the roads, but two of them made due apology, promising to conform to the rules in future, and were restored. It is now three months since a failure has occurred. The consignees have become accustomed to the new order of things, and are much pleased with it. One representative business man remarked that it was the most satisfactory plan that had ever been tried. He considered it much less inconvenience to go himself to the different railroads at a time set apart for the purpose, with no other business to interrupt, than to have possibly as many as nine collectors coming into his office at as many different and inopportune times; and by the new plan he has an opportunity to speak to the agent or cashier about any matter needing attention.

While the plan has been no inconvenience to honest tradesmen, it has compelled dishonest ones to pay promptly. The roads have saved the time of the collectors, and their risk of loss has been reduced to a minimum. Prompt returns of earnings are received, less friction exists than before, and the agents and their forces are brought into closer touch with their patrons. Individual agents, without the co-operation of their competitors, would of course have difficulty in making so radical a change; but where local associations exist the plan should recommend itself, unless a better one is in use. But what better plan can there be?

Foreign Railroad Notes.

A steel rail mill has been established at Nikolajew, in the heart of Siberia, under serious difficulties. At the time the machinery for it was shipped the nearest railroad station was 650 miles from the mill, and the material was all hauled over the roads. This alone took nearly a year's time. All the employees had to be brought in from European Russia, which is not supposed to have a very mild climate; but these men, for the most part, were so appalled by the Siberian cold that most of them ran away after a few days' experience. Those who stayed, though known as good workmen at home, seemed demoralized in Siberia, and the higher employees had to be changed several times. Now, at last, it is said that the works are turning out rails, for which the Siberian Railroad affords a market.

The latest competitor of American cotton-growers is—Russia! On its Trans-Caspian Railroad (but very far from the Caspian) is some fertile country where last year some 450,000 acres were planted with cotton, which produced some 105,000,000 lbs. of cotton (say 210,000 bales), or more than 230 lbs. per acre, which is above the average yield in this country. The quantity is trifling, compared with what is raised in this country, and it is far from a market; but the industry is only fairly begun.

In Germany many commit suicide by throwing themselves in front of moving railroad trains. Someone has collected statistics of such suicides, which show that in the ten years, 1877-86, there were 1,411, and in the following ten years 1,921, while in 1896 there were 217—this in a population of about 53 millions. What proportion this is of the total number of suicides we are not told for all Germany; but in Saxony the railroad suicides were only 1.5 of the whole number from 1887 to 1896. Curiously, these suicides are considerably more frequent in the fine season of the year than in the winter half, but this is true of other as well as railroad suicides. About 45 per cent. of them are in the winter half and 55 in the summer half of the year—possibly because the contrast between nature's gladness and man's misery is greatest in fine weather.

TECHNICAL.

Manufacturing and Business.

The Boston & Lockport Block Co. have completed extensive additions to their East Boston plant. Increased orders from the railroad companies indicate good times.

The Pittsburgh Bridge Co. has created the office of Superintendent of Erection and appointed Mr. A. W. Starr to fill the position.

The Pearson Jack Company, No. 64 Federal street, Boston, Mass., has recently equipped with Pearson jacks the wrecking cars of the International & Great Northern and the Norfolk & Western roads. The company reports a large export business during the past year.

Cotton Bros. & Co., Oakland, Cal., have the contract for building the Government docks at Honolulu, H. I.

George C. Hugill wants a second-hand Ingersoll-Sergeant drill. He has for sale a 25 horse-power engine and boiler.

The Falk Manufacturing Company, Milwaukee, Wis., has changed its name and will hereafter be known as the Falk Company, at the same time taking up several new lines of business. It has acquired the property and interests of the Western Gear Company, Milwaukee, and is now building a plant for making open hearth steel castings. The Falk Company hereafter will control the patents covering the cast-welded rail joint, make switches, frogs and railroad crossings, gears and pinions and steel castings, and will also take contracts for the building of interurban and street railroads.

The Western Electric Co., Chicago, has bought a large amount of improved property on the West Side on West Harrison, Jefferson and Clinton Sts., the cost of the property so far bought being about \$500,000.

The Sterlingworth Railway Supply Company, Easton, Penn., has secured the services of Mr. Karl Dingert as Mechanical Engineer. Mr. Dingert is a graduate of the Stockholm Technical School of Sweden; served three years as shop superintendent of the Swedish State Railroads, one year in the Mechanical Engineering Department of the Pennsylvania Railroad at Altoona, and three years in the same department of the Lehigh Valley.

New Stations and Shops.

On March 9 fire destroyed the tool house of the Central of New Jersey, in Elizabeth, together with the large water tank on top of it.

It is stated that the Great Northern will soon build a large grain elevator at West Superior.

It has been reported recently in some of the technical papers, as well as in the daily newspapers, that the Chicago, Rock Island & Pacific would make large additions to its shops at Valley Junction, Ia., in order to build more cars there. We are officially

informed that the road is not arranging to build new car shops, but intends to put up at that place a shop taken down and moved from another point, and that the road does not expect to build more cars there in the future than in the past.

We are officially informed that the Chicago, Milwaukee & St. Paul does not intend to build a new round-house at Janesville, Wis., as has been reported.

Newspaper dispatches have stated that a new Union station will be built at Jackson, Tenn., to be used by the Mobile & Ohio, the Illinois Central and the Nashville, Chattanooga & St. Louis. We are advised by an officer of one of the companies named that he has not heard anything of a proposed Union station at that point.

The Philadelphia & Reading has let the contract for the building of its new car repair shops at Schuylkill Haven to Armstrong & Printzenhoff, of Philadelphia. The building will be 80x400 ft.

It is reported that the Chicago Terminal Transfer Co. will build a passenger station, freight house and roundhouse at Chicago Heights.

Automatic Block Signaling.

Automatic block signals are to be put up on the line of the Southern Pacific from Sixteenth street, San Francisco, to Baden, Cal., nine miles. This is a part of the Monterey Line of the Coast Division. Block sections will be about one-half mile long.

The San Pedro Breakwater.

Mr. E. Brown, writing from San Francisco to the Scientific American, says that work has been begun on the San Pedro (California) Breakwater, which is to inclose a harbor of refuge. An appropriation of \$2,900,000, of which \$400,000 is available each year, has been made by the Government. The plan contemplates a detached breakwater 8,500 ft. long, with two arms of 3,000 and 2,700 ft., connected with a curve of 1,910 ft. radius, 1,800 ft. long. The shore end begins 1,200 ft. from land in 3½ fathoms, gradually deepening to 8½ fathoms. The rock will be secured from San Clemente Island, 52 miles distant, where contractors are now at work. Much machinery has been put in on the island and air compressors and drills have been ordered.

Baldwin Locomotives for France.

The Baldwin Locomotive Works have received an order for 10 locomotives for the State Railroads of France. These are high speed passenger engines with 84 in. driving wheels. Four of them are to have Vaucrain compound cylinders and the other six are to be single expansion engines. This order is perhaps even more interesting than that for the engines for the Midland Railway of England, inasmuch as France is a highly protective country. The Midland order, by the way, has been increased from 10 engines to 30. The state railroad system in France is quite important, aggregating 1,748 miles.

The Water Power of the Chicago Drainage Channel.

The Sanitary District Trustees, Chicago, have so far failed to receive any bids for the water power near Lockport, Ill., and about 30 miles from Chicago, in reply to letters sent out several weeks ago to men interested in this class of improvement. As the District has no authority or funds to develop this water power itself, it was decided to lease to an individual or corporation the water rights, the lands necessary for a power plant and the right of way along the banks of the channel for electrical transmission as far as Roby Street. The rental was to be based upon a fixed yearly charge per horse-power, capable of being developed by the volume of water supplied at the head made available. The head and tail races and wheel pits being considered as a permanent investment, the cost would be paid by the Sanitary District out of the proposed rentals. It has been estimated that 18,000 h. p., net, could be developed at Lockport continuously for the whole 24 hours, and being so near Chicago, all the current could readily be sold, the only fixed investment for the lessors being for turbines, electrical generating and transmission machinery. It was expected that there would be considerable competition for these privileges, but so far the results have been exactly the opposite.

Repairs West of the 105th Meridian.

The committee appointed by the M. C. B. Association to report at the convention in 1899 on the question, "Should Any Additional Compensation be Paid for Car Repairs Done West of the 105th Meridian," desires to procure the following information:

1. What is the average pay of your freight car repairers and carpenters?
2. Refer to M. C. B. prices in effect Sept. 1, 1898, pages 26, 28 and 27, and state the cost to your company of the material enumerated therein.
3. What, in your opinion, would be an equitable percentage to be added to the M. C. B. prices for repairs made west of the 105th Meridian?
4. What is the annual freight car mileage made by your freight cars on foreign lines?
5. What is the annual freight car mileage made on your road by foreign cars?
6. Please state amount paid annually to foreign lines for car mileage, and the amount collected from foreign lines for mileage made by your cars.
7. How much do you pay annually to foreign lines for repairs to your cars?
8. How much do you collect annually from foreign lines for repairs made by your company to foreign cars?
9. What changes would you recommend in the present M. C. B. prices?

Send replies to J. N. Barr, Superintendent of Motive Power, C. M. & St. P. Ry., West Milwaukee.

The M. C. B. Standards.

The Committee on the Supervision of Standards and Recommended Practice of the Association will be glad to receive suggestions in reference to any modifications of the established standards and recommended practices of the Association that are justified by experience in their use. The committee would also like to know, in connection with each of the standards, whether they have been adopted and whether they are in practical use as standards on the equipment of each road. Replies should be sent not later than March 31 to A. M. Waitt, Chairman.

M. C. B. Couplers on the Illinois Central.

The Illinois Central recently replaced the Miller hook couplings on all its passenger cars with couplers of the M. C. B. type, made by the Trojan Coupler Co. The materials were sent in advance to terminal points for passenger trains, and the change was made on the entire system in one day, Sunday being selected as the best time for doing the work. No alterations were required in the draft rigging, and it was only necessary to put on a new carrying iron, remove the Miller hook, and slip the new coupler into place.

American Tools Abroad.

We published last week an extract from Engineering (London), under the title "Good Workmanship," concerning certain directions in which American manufacturing engineers seem to be ahead of English practice. The Engineer also has started up discussion about American machine tools among its correspondents. In the issue of March 3 we find a letter from Messrs. J. Tylor & Sons, written by Mr. Philip Bright, Joint Managing Director. Mr. Bright says that one evident reason for the superiority of the product of the American tool makers is that we work more in specialties here. An Englishman will take an order to build almost any kind of a machine. Our makers turn out standard sizes and can generally deliver in about one-quarter the time that an English maker requires, and the English machine tools will be perhaps of inferior design and finish and of higher price. The Americans excel particularly in designing tools to make work to samples. No difficulty seems too great for them, and their estimates of cost of work are rarely exceeded, so well do their tools perform. Mr. Bright says that he has not discovered any English firms willing to take so much trouble as do the Americans. He lately visited the works of a firm of English tool makers who, in correspondence in the columns of the Engineer, have written against the American tools. To his surprise he found that that concern sold a considerable number of American made lathes and that their works contained more American machinery than English, and that they were producing on this machinery work of an excellent quality, and that they were just about putting in an American molding machine.

Protecting Parts of Steel Cars.

The Goodwin Car Co. writes to us concerning some steel cars now building, that all parts of these cars will be thoroughly coated with "carburet black" before being assembled, to protect the steel from coal acids.

THE SCRAP HEAP.

Notes.

The Appellate Division of the Supreme Court of New York has decided that an ordinance of the city of Brooklyn requiring street cars to be equipped with fenders, to hang not more than three inches from the ground, is invalid, as making a requirement which cannot be reasonably complied with.

The Baltimore & Ohio will, on May 1, abolish the slow process of running the pay cars over the entire road, involving an expenditure of three weeks' time in distributing a large bulk of currency, aggregating a million dollars a month, and will adopt the more convenient, expeditious and safer process of distributing, through the hands of the station agents, checks, payable at any one of the 37 banks on the line, and by any agent of the company.

Lands amounting to about six million acres, granted by the Government to the Union Pacific Railroad and lying in the states of Nebraska, Wyoming, Colorado and Utah, were sold at auction at Omaha, March 6, this sale being necessary to settle the financial affairs of the old Union Pacific Company. The lands were bought by the new company. This property was included in the sinking fund mortgage of Dec. 8, 1898.

Another Gas Explosion That Did Not Explode.

The usual monthly report of the explosion of a Pintsch gas tank under a railroad car is received, and, as usual, there was no Pintsch gas and it did not explode. This time the report is from St. Louis and is very circumstantial, to the effect that on March 6 a Pintsch gas tank in the Pullman car "Latonia" exploded, shaking the buildings in the neighborhood and tearing things up at a great rate. In fact, the explosion took place in the "Monmouth" and not in the "Latonia," and the tank which burst was a Baker heater expansion drum on the roof of the car.

The Moscow (Russia) Electric Railroads.

The City Council has advised all contractors who desire to bid for building the electric railroads in that city to make application to the City Council not later than April 12. The sum of \$375 must accompany

each application. To all parties applying for terms and conditions of the concessions, the Council will supply necessary drawings and statistics of the tramways in Moscow for the past five years, profits in the different localities, list of existing lines and the approximate costs, for making out the estimates. (Jan. 27, p. 68.)

Brooklyn Bridge Earnings in 1898.

The report of Bridge Commissioner John L. Shea of the Brooklyn Bridge, shows that for the year 1898 the receipts aggregated \$704,478, and the expenditures \$512,250, leaving a balance of \$192,228. Though the working expenses have been reduced by \$38,000, as compared with those of 1897, the balance is \$10,000 less than the balance for that year. Among the largest items were: Tolls from the roadway, \$76,261; from the bridge railroad, \$389,773; from the electric cars, \$50,727; from the elevated railroads, \$45,528. The remainder of the receipts came from rentals. The balance of receipts over expenditures has never been greater than \$200,000.

A Gale in Chicago.

Late on the evening of March 11 a gale of wind at velocities of from 35 to 45 miles an hour, blew down the wall four stories high of the Wabash Ave. side of the McClurg Building, which was destroyed recently by fire. One man, who was passing on the street, was killed, and the wall fell on the elevated loop structure, damaging the Madison St. station considerably. A South Side Elevated train which was passing at the time was caught in the debris and was unable to proceed, as the tracks were blocked with brick and stone. The elevated loop was blocked until Sunday afternoon. The surface loop of the State St. line, which passes around the corner of Madison St. and Wabash Ave., was also tied up, the cars being switched by horses in State St.

Rubber Belting in a Grain Elevator.

An important feature of the equipment of the Hoo-sac Tunnel elevator, recently completed at Charles-town, Mass., for the Fitchburg Railroad, is the rubber belting which is used as carriers for the grain in the various galleries, and to which the buckets are attached for lifting the grain to the large storage bins. The contractor for the elevator, Mr. James L. Record, of Minneapolis, Minn., awarded the order for the belting to the Boston Belting Co., of Boston, Mass. It comprised about 7,500 ft. of 36-in. four-ply, 1,600 ft. 38-in. four-ply and 4,800 ft. of 22-in. six-ply, besides a quantity of narrower belts. The total weight of all the belts was upward of 35 tons. The longest 36-in. four-ply belt measured 1,500 ft., and several others of the same width were more than 1,000 ft. long each. Each of the 36-in. belts carries about 8,000 bushels of grain an hour.

Revenue Stamps on Bills of Lading in Georgia.

Judge Emory Spear of the United States Court at Macon, Ga., in the equity case brought by stockholders of the Southern Express Company to determine the right of the Georgia Railroad Commission to require the payment by the express company of the revenue stamp attached to receipts, has ruled that the Commission has no power to construe an act of Congress or to issue a mandate regarding it. The tax is for national purposes, and its payment or collection is in no sense, directly or indirectly, within the sphere of a state administrative board. It is not a part of the price paid for service rendered. Further, the Judge said, the state having no pecuniary interest at stake, has no right to ask a construction of the act. The Commission was enjoined not to enforce its order, but the question of the liability of the express company or of the shipper to pay the revenue tax was not determined.

Sunday Trains on the D. L. & W.

Officers of the Delaware, Lackawanna & Western tell the reporters that the company will at once begin running local passenger trains to and from New York City on Sundays. For 30 years or more, the road has denied all applications for Sunday trains. The through trains of Saturday night, which end their trips early Sunday morning, and the through trains of Sunday night, which begin their trips at seven or eight o'clock, have afforded some accommodation to a few of the larger towns, and there are one or two milk trains, and one other through passenger, but aside from this, there has been no accommodation, and the stations have been mostly closed on Sunday. Many persons have settled along the line of the Lackawanna, partly because there were no Sunday trains, and a few years ago, when there was talk of running such trains, some of the people of Orange protested against any change, because their town would be overrun on Sunday by undesirable persons. Now it is expected that there will be seven new trains each way on Sunday between New York and Dover, about 40 miles out.

Northwestern Elevated, Chicago.

Structural iron for the unfinished half of this road is now being finished and will be erected this summer. The power plant will be built on Fullerton Ave., near Southport Ave., and the power house will be 3,000 ft. from the nearest part of the elevated structure. Work has been begun on the site, which was selected for its proximity to coal and water supplies. Coal can be taken directly to the plant from the cars on the Chicago, Milwaukee & St. Paul road, and water can be obtained from a large conduit in Fullerton Ave. The power house will be built of brick, one story high, fronting 112 ft. on Fullerton Ave., and 225 ft. deep. An engine of 7,000 h. p. has been planned for, and the plans also provide for an extension in the rear for 5,000 additional horse power. The octagonal stack will be built of brick and will be 203 ft. high. The piling foundation for the stack is now being put in. The walls of the building will be 49½ ft. high, and the flat roof will be of concrete. The power house will be divided into a boiler room 50 ft. wide, and an engine room 53 ft. wide. There will be 12 water tube Babcock & Wilcox boilers of 400 h. p., each arranged in six batteries and fired by Murphy furnaces. A complete coal and ash handling plant with outside and inside storage bins for coal will be provided. The engine room will contain four direct-connected engines and dynamos, three of 1,500 k.w. each, and one of 800 k.w. These will be cross-compound, condensing, slow-speed Corliss engines built by the Atlas Engine Works of Indianapolis, and they will drive Siemens & Halske generators having internal armatures. Two 35-ton overhead traveling cranes built by the Walker Co. will be used in the engine room.—Western Electrician.

South American Notes.

Proposals have been submitted by capitalists, American and European, to the Venezuelan Govern-

ment for building a railroad from Las Tablas, on the River Orinoco, to the gold fields of Yurnari.

The Guanta Railroad and the coal fields at its inland terminus in Venezuela have been leased to Lanzoni, Martini & Co., of Rome, for 15 years, for an annual rental of \$20,800, and 10 cents a ton royalty on the coal mined.

The Huanchaca of Bolivia Silver Mines Co. announces the appointment of a commission to enter into new arrangement for working the Autofagasta & Bolivia Railroad. The parent company (Huanchaca of Bolivia S. M. Co.) reports marked improvement in its operations. The water, which had drowned out the mines, had been reduced so as to render available ore bodies estimated to contain 16,000,000 ounces of silver, and plans are being prepared for a drainage tunnel which will restore the whole of the mines to a condition suitable for mining. It is estimated that this tunnel will effect a saving of \$3,000,000 per annum in the cost of mining.

According to Mr. W. Goodwin, the official grain inspector of the River Plate, the Argentine wheat crop for 1897-98 amounted to 1,400,000 tons, from an acreage of 5,000,000 acres. The exports of wheat and flour for the season (incomplete at the time of issuing of the report) were 770,000 tons.

The settlement of the railroad guarantee difficulties in Argentina by the acceptance on the part of the companies of 4 per cent. bonds, has been effected with all the lines interested except the Buenos Ayres and Valparaiso Transandine Railroad.

English capitalists are seeking a concession for the construction of a trans-Andine railroad from Chill to Argentine via Tanguirica and Villa Mercedes. A 4 per cent. guarantee on \$2,500,000 is asked for, but \$8,000,000 are said to have been subscribed for the undertaking if the concession is granted.

Technical Schools.

Purdue University.—Among the thesis subjects in the Department of Mechanical Engineering, of which about 38 per cent. are on railroad subjects, are the following: "Analysis of the Efficiency of Locomotive Schenectady No. 1 by the Entropy-Temperature Method;" "A Study of the Action of Air in the Train Pipe During Service and Emergency Applications of Air Brakes;" "Tests of a 125 h. p. Westinghouse Gas Engine;" "Tests to Determine the Relative Strength of Large and Small Bolt Heads;" "Effect of Pressure Upon the Coefficient of Friction of Different Brake Shoes;" "Effect of Speed Upon the Coefficient of Friction of Different Brake Shoes;" "A Study of Cylinder Condensation in Schenectady No. 2;" "An Experimental Study of Gas Engine Performance;" "A Study of the Behavior of Materials in Impact;" "The Application of Mechanics to the Determination of the Strength and Stiffness of Car Details;" "Tests to Determine the Homogeneity of Iron and Steel;" "The Comparative Study of the Action of Different Locomotive Injectors." Of the ten subjects in the Department of Electrical Engineering one is on a "Test of Modern Street Car Motor Equipments," the others including several tests of motors and electric lighting plants. In the Department of Civil Engineering about 40 per cent. are on railroad subjects, among which are the following: "The Design of a Railroad Bridge;" "The Design of a Steel Dam;" "The Design of a Water Filtration Plant;" "The Design of a Bascule Draw Bridge;" "The Design of a Railroad Plate Girder Bridge;" "The Design of a Single Track Deck Pratt Truss Bridge;" "The Design of a Pratt Truss Railroad Bridge;" "The Design of an Elevated Water Tank;" "The Design of a Wrought Iron Railroad Viaduct." In this department among other subjects are several on bridge, truss and water-works design. University of Minnesota.—Among thesis subjects for 1899 in the departments of Mechanical and Civil Engineering are: "The Efficiency of Roller Bearings;" "Design of a Locomotive" (principal parts); "Design of a Steel Elevator Construction." The subjects in the Electrical Engineering Department are on telephone and switchboard design.

LOCOMOTIVE BUILDING.

It is rumored that the Chicago, Rock Island & Pacific is considering buying some engines.

The Warwick Iron Co. has placed an order with the Baldwin Locomotive Works for one eight-wheel locomotive.

We understand that the Michigan Central is preparing specifications and considering ordering locomotives.

We understand that the Fonda, Johnstown & Gloversville has placed an order with the Schenectady Locomotive Works for one locomotive.

The Baldwin Locomotive Works have an order for two medium heavy Atlantic type passenger engines for the New York, Philadelphia & Norfolk.

The 15 mogul locomotives ordered by the Chicago, Burlington & Quincy from the Baldwin Locomotive Works, as noted in our issue of March 3, will be modified class H engines. The boilers will be larger than the old class H engines, and will be of the Belpaire type. The total weight will be about 140,000 lbs. The cylinders will be 19 in. in diameter, by 26 in. stroke, instead of 24 in. stroke, and piston valves will be used. The drivers will be 63 in. in diameter and all wheels will be flanged.

In our issue of March 10 we stated that the Missouri, Kansas & Texas had placed an order with the Richmond Locomotive & Machine Works for 10 mogul locomotives. These are for September delivery. The weight on drivers will be 104,000 lbs.; total weight, 124,000 lbs.; cylinders, 19 in. x 26 in.; diameter of drivers, 57 in.; boilers, straight top, with 180 lbs. working steam pressure; fireboxes, 96 $\frac{1}{2}$ in. long and 42 in. wide; tank capacity for water, 4,300 gals. New York air brakes, steel axles, National hollow brake beams and Sargent brake shoes will be used.

The Louisville & Nashville placed on March 7 the order for 15 simple locomotives noted in our issue of last week. They will be built by the Richmond Locomotive Works, and are for July and August delivery. Four of these engines will be 10-wheel passenger locomotives, and 11 will be consolidation engines. Of the latter two will have cylinders 21 in. in diameter, by 26 in. stroke, and nine will have cylinders 21 in. by 28 in. They will weigh 156,000 lbs., of which 139,000 lbs. will be on the drivers, which will be 45 in. in diameter. They will have Belpaire boilers, and the fireboxes will be 123 in. long and 33 $\frac{1}{2}$ in. wide. The tank capacity for water will be 4,500 gals. The passenger engines will have a total weight of 133,000 lbs., of

which 98,000 lbs. will be on the drivers, which will be 57 in. in diameter. The cylinders will be 18 $\frac{1}{2}$ in. by 26 in. The boilers will be of the wagon top type and the fireboxes 96 $\frac{1}{2}$ in. long and 40 in. wide. Tank capacity 4,200 gals. of water. All of the engines will have New York air brakes and oil tempered nickel steel axles.

CAR BUILDING.

The Maine Central has ordered 100 box cars from the Laconia Car Co.

It is reported that the Swift Refrigerator Line will soon order some new refrigerator cars, probably 100 or more.

It is reported that the Kingan Refrigerator Line has ordered about 75 refrigerator cars from Wells & French.

The Pennsylvania has ordered from Pullman's Palace Car Co. the 500 34-ft. standard box cars noted in our issue of March 3.

We understand that the Fonda, Johnstown & Gloversville has placed an order with Jackson & Sharp Co. for two passenger coaches.

The Baltimore & Ohio Southwestern is said to have ordered 2 first-class passenger cars, 2 postal cars and 4 baggage cars from Barney & Smith.

The Lorain Steel Co. is reported as asking bids on from 100 to 200 gondola cars with low sides, to be 66 ft. 4 in. long, and of 80,000 lbs. capacity, for carrying rails; 25 flat cars 35 ft. long, and 35 gondola cars 35 ft. long.

In our issue of March 10 we noted that specifications had been issued by the Atchison, Topeka & Santa Fe for 1,000 box cars. This order has been withdrawn from the market for the present, on account of the high prices.

The Missouri, Kansas & Texas will let next Monday or Tuesday 1,400 30-ton box cars, 200 50-ft. furniture cars, 100 45-ft. furniture cars, 200 40-ton coal cars, and 100 refrigerator cars, all for September delivery, or earlier, if possible.

The 1,000 box cars of 80,000 lbs. capacity on which the Atchison, Topeka & Santa Fe is receiving bids, as noted last week, will be 40 ft. long, 9 ft. wide and 9 ft. high. Iron axles, Player bolsters and Player steel trucks and brake beams; Congdon brake shoes; Trojan couplers; American continuous draft rigging; Chicago-Cleveland roofs; spiral coil springs, and Ft. Madison wheels will be used. This road will also build 100 50-ft. furniture cars at its Topeka shops.

The Goodwin Car Company is drawing plans for 1,000 of its patent steel coal cars for a coal and coke company. The cars are to be delivered within 90 days from completion of the plans. They are to have a capacity of 80,000 lbs. of coal and to be equipped with air and hand dumping apparatus and center and side dumping valves. All parts will be thoroughly coated with carbureted black before being put together, to protect the steel from coal acids. In all other respects they will have the same equipment as the cars now being built by the Goodwin Car Co. at Elmira, N. Y.

The Cleveland, Cincinnati, Chicago & St. Louis is building at its Brightwood and Linndale shops 125 flat cars, and 125 coal cars similar to those we illustrated Feb. 17, p. 119. These cars will be completed during this month and all will be of 80,000 lbs. capacity. They will weigh 32,000 lbs. and be 38 ft. long and 10 ft. wide. The axles will be steel 5 in. by 9 in., the journal boxes will be cast iron with pressed steel lids; the wheels and brake shoes will be cast iron. The trucks and draft rigging will be the standard of the road. Westinghouse air brakes, National hollow brake beams and phosphor bronze brasses will be used.

We are informed that the Ottawa Car Co. is building six cars for the Vancouver Electric Railway, Vancouver, B. C.

The Rapid Transit Railway Co., of Dallas, Tex., has recently bought six open cars, and it is possible that the company may buy more cars, but nothing definite has been decided upon.

R. Kenna, Cambridge City, Ind., says that contracts will be let in July for the proposed equipment for the Cambridge City Inter-Urban Traction Co., consisting of six closed motor cars and six open and four closed trailer cars. (See Electric Railroad Construction column.)

Bids will be wanted in about two months for two closed motor cars for the Redlands Street Railway, Redlands, Cal., which road is to be changed from mule power to electric. Henry Fisher is President, and O. H. Childs Secretary and Purchasing Agent. (See Electric Railroad Construction column.)

BRIDGE BUILDING.

BROOKHAVEN, MISS.—The New Jersey Steel & Iron Co. has secured the contract for the steel bridge across the Homockitto River in Lincoln County, at \$7,750. (Dec. 16, 1898, p. 901.)

BROWNSTOWN, IND.—The County Commissioners have been petitioned for an 85-ft. bridge over the Symons Creek, to cost about \$1,200.

BUFFALO, N. Y.—Resolutions have been adopted to secure the rebuilding of the Ohio St. bridge.

CAMBRIDGE, O.—The Baltimore & Ohio, in making improvements on the 53 miles of road between Bellaire and Cambridge, will replace all the bridges with new double track steel structures.

CHICAGO, ILL.—Arrangements for the new bascule bridge at South Canal St. have been completed. The Drainage Board will give land at that point to make the channel 100 ft. wide and will divide the cost of building the bridge equally with the city, each paying \$35,000. (Mar. 10, p. 177.)

On May 10 the Drainage Board will open bids for building the Chicago & Western Indiana R. R. bridge across the main channel near California Ave.

Bids are also wanted on a swing four-track structure, having a span of 334 ft. 6 in., on the line of the Belt Railway of Chicago crossing the Main Channel at the east end of Section "K."

CRANSTON, R. I.—Highway Commissioner Conley has reported to the Town Council that the railroad bridge on Narragansett Ave. is in a dangerous condition and should be rebuilt.

Town Engineer Latham has reported on the wooden bridge over the New England R. R. in Arlington. The railroad has agreed to make the improvement. (Feb. 10, p. 106.)

DAGSBORO, DEL.—The House has passed a bill authorizing a new bridge near Dagsboro, Sussex county.

DOVER, DEL.—A bill has been introduced in the Legislature authorizing Sussex county to build a bridge over White's Creek.

DUBUQUE, IA.—A committee has been formed and are securing subscriptions for the Eagle Point bridge.

EUREKA, MO.—Citizens of Pacific and Valley Park have organized an association to build a bridge across the Meramec River, between Eureka and Crescent. The association is to have a capital stock of \$50,000.

EVANSVILLE, IND.—The Illinois Central will rebuild several trestles at McClain and Major, Ky., about six miles south of Evansville.

GRAND FORKS, N. D.—Proposals will be received by J. W. Scott, County Auditor, until April 3, for building any or all wooden bridges to be built by the county during the year 1899, according to plans and specifications now on file in his office.

HAYWARDS, CAL.—The County Supervisors have decided to rebuild the bridge on the mountain road beyond Haywards.

JAMESTOWN, N. Y.—A resolution has been adopted by the City Council providing for plans and specifications for a bridge on Fairmount Ave. Another bridge is considered at the boat landing.

JERSEY CITY, N. J.—The Board of Freeholders have decided to proceed with the Pacific Ave. bridge, under an agreement with the Lehigh Valley R. R. Co. Emmett Smith, Chief Engineer.

KESWICK, CAL.—A bridge will be built across the Sacramento River at Spring Creek.

NEW ALBANY, PA.—Two bridges were destroyed by an ice flow March 4. H. E. Bull, Surveyor, Bradford County, Towanda.

NEWARK, N. J.—Messrs. Carrere & Hastings, New York architects, have been engaged by the Essex County Park Board to prepare plans for the bridge over the Morris Canal at Sixth Ave.

A new bridge will probably be built over the Passaic River in connection with the plans of annexing Arlington with Newark.

PITTSBURGH, PA.—Chas. Davis and G. W. Lea, viewers in the matter of locating a bridge over McLaughlin's Run in Upper St. Clair Township, in their report recommend straightening the channel of the Run about 115 ft., and building a bridge at a point on the highway from Bridgeville to Sodern.

RIVERTON, PA.—The Northern Central is preparing plans for a bridge to connect with the Cumberland Valley.

ROSSVILLE, KAN.—City Clerk C. E. Fritz informs us that a bridge, about 800 ft. long, will be built across the Kansas River, three miles south of this place.

SAVANNAH, GA.—The Directors of the Georgia & Alabama R. R. have accepted the act of Congress authorizing the company to build a bridge across the Savannah River to its new terminal. The bridge will cost \$100,000. Plans are now before the Secretary of War.

SEATTLE, WASH.—(See Electric Railroad Construction column.)

SYRACUSE, N. Y.—Plans have been prepared for a bridge across the Erie Canal at Catharine and Almond Sts. Appropriations for this work are \$15,000. R. R. Stuart, City Engineer.

VANDERGRIFT, PA.—The Grand Jury has recommended a bridge to be built across Kiskiminetas River at this place, to be paid for by Armstrong and Westmoreland counties.

WASHINGTON, PA.—Oliver S. Brown and Henry B. Angle have been appointed viewers by the County Court for a new bridge over the East branch of the Antietam Creek in Washington Township.

A. J. Unger and John L. Landis are appointed viewers to inquire into the necessity of a bridge over Back Creek on the highway from St. Thomas to Housum.

XENIA, O.—The Xenia & Williamton Traction Co. will need one bridge. (See Electric Railroad Construction column.)

YONKERS, N. Y.—The Senate has passed the bill granting the city of Yonkers land under the water of the Hudson River, near the mouth of the Nepperhan River, for the purpose of a public street and a bridge.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Chicago, Milwaukee & St. Paul.—Preferred, 3 $\frac{1}{2}$ per cent., common, 2 $\frac{1}{2}$ per cent., payable April 20.
Pittsburgh, Cincinnati, Chicago & St. Louis.—Preferred, 1 $\frac{1}{2}$ per cent., payable March 20.
Pittsburgh, Youngstown & Ashtabula.—Preferred, 3 $\frac{1}{2}$ per cent.; common, 3 per cent., payable March 25.
Union Pacific.—Semi-annual, preferred, 1 $\frac{1}{2}$ per cent., payable April 29.
Waynesburg & Washington.—Annual, 2 $\frac{1}{2}$ per cent., payable March 15.

Manhattan Elevated (N. Y.).—Quarterly, 1 per cent.
United Traction & Electric Co. (Providence).—Quarterly, 1 per cent., payable April 1.
West End St. Ry. (Boston).—Annual, \$1.75 per share, payable April 1.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:
American Society of Civil Engineers.—Meets at the house of the Society, 220 West Fifty-seventh street, New York, on the first and third Wednesdays in each month, at 8 p. m.

Association of Engineers of Virginia.—Holds its formal meetings on the third Wednesday of each month from September to May, inclusive, at 710 Terry Building, Roanoke, at 5 p. m.

Boston Society of Civil Engineers.—Meets at 715 Tremont Temple, Boston, on the third Wednesday in each month at 7.30 p. m.

Canadian Society of Civil Engineers.—Meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday at 8 p. m.

Central Railway Club.—Meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 2 p. m.

Chicago Electrical Association.—Meets at Room 1737, Monadnock Building, Chicago, on the first and third Fridays of each month at 8 p. m. J. R. Cravath, Secretary.

Civil Engineers' Club of Cleveland.—Meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

Civil Engineers' Society of St. Paul.—Meets on the first Monday of each month except June, July, August and September.

Denver Society of Civil Engineers.—Meets at 3 Jacobson Block, Denver, Col., on the second Tuesday of each month, except during July and August.

Engineers' Club of Cincinnati.—Meets at the rooms of the Literary Club, 25 East Eighth street, on the third Tuesday of each month, excepting July and August, at 6.30 p. m.

Engineers' Club of Columbus, (O.).—Meets at 12½ North High street on the first and third Saturdays from September to June.

Engineers' Club of Minneapolis.—Meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

Engineers' Club of Philadelphia.—Meets at the house of the Club, 1122 Girard street, Philadelphia, on the first and third Saturdays of each month at 8 p. m., except during July and August.

Engineers' Club of St. Louis.—Meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

Engineers' Society of Western New York.—Holds regular meetings on the first Monday in each month, except in the months of July and August, at the Buffalo Library Building.

Engineers' Society of Western Pennsylvania.—Meets at 410 Penn avenue, Pittsburgh, Pa., on the third Tuesday in each month at 7.30 p. m.

Locomotive Foremen's Club.—Meets every second Tuesday in the club room of the Correspondence School of Locomotive Engineers and Firemen, 335 Dearborn street, Chicago.

Montana Society of Civil Engineers.—Meets at Helena, Mont., on the third Saturday in each month at 7.30 p. m.

New England Railroad Club.—Meets at Pierce Hall, Copley Square, Boston, Mass., on the second Tuesday of each month.

New York Railroad Club.—Meets at 12 West Thirty-first street, New York City, on the third Thursday in each month at 8 p. m., excepting June, July and August.

Northwest Railway Club.—Meets on the first Tuesday after the second Monday in each month at 8 p. m., the place of meeting alternating between the West Hotel, Minneapolis, and the Ryan Hotel, St. Paul.

Northwestern Track and Bridge Association.—Meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2.30 p. m.

St. Louis Railway Club.—Holds its regular meeting on the second Friday of each month at 3 p. m.

Southern and Southwest Railway Club.—Meets at the Kimball House, Atlanta, Ga., on the second Thursday in January, April, August and November.

Technical Society of the Pacific Coast.—Meets at its rooms, in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month, at 8 p. m.

Western Foundrymen's Association.—Meets in the Great Northern Hotel, Chicago, on the third Wednesdays of each month, A. Sorge, Jr., 1533 Marquette Building, Chicago, is Secretary.

Western Society of Engineers.

At a special meeting of the Western Society of Engineers, held in the Society rooms, Chicago, Wednesday evening, March 15, Mr. L. A. Ferguson, Superintendent of the Chicago Edison Company, read a paper on "The Development of a Central Lighting Station."

The question of reducing the entrance fee and the dues of junior members has been submitted to letter ballot. It is proposed to make the junior entrance fee \$3 instead of \$10, and the annual dues for both resident and non-resident juniors \$5. At present the dues are \$7.50 for resident juniors. It is thought that this change will enable many young men to enter the Society and a special effort will be made this year to increase the junior membership.

Association of Engineering Societies.

The list of the members of the Associated Societies now containing about 1,500 names, is published. The report of the Secretary of the Association shows remarkable prosperity. Ever since 1894 the financial condition of the Association has been improving, the excess of assets over liabilities increasing, while the assessments upon the societies have decreased. In 1898 the annual assessment per member had been reduced to \$2, and yet, at the end of the year, the assets exceeded the liabilities by nearly \$3,000. The \$2 annual assessment for 1899 will probably be reduced by a dividend of \$1 per member on account of surplus in the treasury. In return for the annual assessment, the members of the societies receive the papers and proceedings, not only of their own societies, but of all the others in the Association.

During 1897 the Detroit Engineering Society, and in 1898 the Engineers' Club of Western New York, the Louisiana Engineering Society and the Engineers' Club of Cincinnati became members of the Association.

New England Railroad Club.

The annual meeting of the club was held at Pierce Hall, Boston, Mass., Tuesday evening, March 14. Mr. C. C. Elwell, Superintendent of the N. Y. N. H. & H. RR., delivered an address, illustrated by stereopticon views, on "Travel in Europe."

The following officers and committees for the ensuing year were elected:

President, W. P. Appleyard.
Vice-President, Henry Bartlett.
Secretary, E. L. Jones.

Treasurer, Chas. W. Sherburne.

Finance Committee: The President, F. E. Barnard and W. S. McGowan, Jr.

Executive Committee: The President, C. E. Fuller, T. B. Purves, Prof. C. F. Allen, J. W. Marden, W. J. Robertson, Henry Bartlett, F. B. Smith, Chas. F. Baker and J. T. Chamberlain.

At the next meeting of the club, to be held Tuesday evening, April 11, Prof. Edward F. Miller of the Massachusetts Institute of Technology, will read a paper on "The Use of the Steam Engine Indicator" in setting valves and in investigating some of the defects brought out by the indicator cards.

The Association of Railroad Air Brake Men.

The annual meeting of the Association of Railroad Air Brake Men will be held at the Cadillac Hotel, Detroit, April 11, 12 and 13. Committees are expected to report on the following subjects: "Air Gages for Air Signal and Driving Wheel Brakes;" "Breaking Apart of Trains;" "The High Speed Brake;" "Recording Gages for Air Pressure and Shocks;" "Yard Air Brake Repairs for Cars;" "Steam Heating of Passenger Cars;" and "Organization of Air Brake Departments."

There are also ten subjects announced for topical discussion, as follows: "Disposition of the Air Pump Exhaust;" "Efficiency of the 9½ in. Air Pump Compared to That of Other Compressors;" "The Use of Water Brakes for Locomotives;" "The Location of Gages in Locomotive Cabs;" "Methods of Locating Defective Parts of Triple Valves;" "Care of Whistle Signal Valves on Locomotives;" "Importance of Tight Non-Return Check Valves in the Westinghouse Triple;" "Packing for Air Pump Piston Rods;" "The Best Method of Connecting Up the Air Brakes of Double-headers;" and "The Importance of the Running Test of Brakes at Terminals."

Mr. P. M. Kilroy, Pine Bluff, Ark., is the Secretary, and Mr. T. A. Hendendahl, 4170 Cass street, Omaha, Neb., is the Chairman of the Committee on Subjects.

Engineers' Club of Cincinnati.

The one hundred and third regular meeting of the club was held on the evening of Feb. 16. Beginning with this meeting, the new arrangement of assembling for dinner at 6 o'clock was inaugurated. There were 22 members and 6 visitors present. The memoir committee presented a short sketch of the life of Israel Ludlow, the pioneer surveyor of Ohio.

Mr. M. D. Burke read a paper on "Street Railroad Track Construction," in which he reviewed and criticized the various forms of construction, from that which was sufficient for the old horse car to the vastly superior but still imperfect practice that served for the heavy electric cars of the present time. An improvement was suggested, in the line of permanent road-bed, by the adaptation of the concrete block foundation for the support of the rails. He would make these blocks continuous or in sections joined together, 18 in. deep, 24 in. wide at the base and 12 in. wide on top, to which the rails would be secured by holding-down bolts embedded in the concrete, and prevented from spreading by the use of gage-bars. A modification was also suggested for the disposition of material in the full-grooved girder rail, now much in use for paved streets, by which a larger per cent. of the metal is located in the head.

National Association of Merchants and Travelers.

At the spring meeting of this association in Chicago, March 8, an informal dinner was given at the Auditorium, which was attended by about 150 men prominent in mercantile, railroad and manufacturing business. The object of the meeting was similar to that of the mercantile and railroad conference on passenger matters held at Chicago last fall, and noted in these columns at the time; namely, to promote a better understanding and closer co-operation between business men and the railroads. At the meeting last week Mr. George R. Blanchard gave an address on "Transportation Problems."

In beginning his address, Mr. Blanchard spoke of the development of transportation in this country, and of governmental attempts at adjusting different interests. The Interstate Commerce Commission, he said, had done much to adjust local freight rates to through rates. The railroads themselves had adjusted many difficulties, including unreasonably high rates, classification problems, extravagance of management, extraneous business interests and watered stock. The problems yet to be solved are those of unjust discrimination, both as between localities and between individuals. After speaking of the difficulties of adjusting freight rates between localities, especially the grain tariffs to New Orleans and the Atlantic, Mr. Blanchard passed to the question of personal discriminations. He urged that merchants cease trying to get discriminations in their own favor, and said that they were often as culpable as railroad officials. In this connection he said: "I may be forecasting a transportation millennium, but I hope earnestly for that time when a railway will dismiss any officer, from the President down, who sanctions an unjust preference; but on that same day I hope to see boards of trade and mercantile exchanges and associations deny their great privileges to any of their own members who solicit or receive such illegal rewards."

Speaking of ways for securing fair rates for all, Mr. Blanchard asked first for sound and fairly expressed judgment from merchants and forwarders; second, that such sentiment be persistently expressed and urged at Washington; and last, that the railroads meet the question fairly, so that a triple alliance of merchants, government and railroads be formed for the good of all. From the success of State railroad commissions, he held that a national commission with proper authority could accomplish much good. He also favored the authorization of pools to be made under the supervision of the Interstate Commerce Commission. He said: "I believe we could, by these combined methods, have national transportation, peace and equity as a supplement to the general geographical adjustment of rates, which has been so fairly well made, so that both the adjustment of due rates and their maintenance shall be alike permanent and equitable." He met the objections to pooling by arguing that the forces of competition as they would then exist would protect the public and keep matters level.

Mr. Blanchard was given a vote of thanks at the conclusion of his address. It is planned to hold four of these meetings in Chicago during this Spring. It is hoped that Chairman Knapp, of the Interstate Commerce Commission, will be the speaker at the second meeting, and that either Prof. Hadley or Mr. H. C. Adams will speak at the third meeting.

PERSONAL

(For other personal mention see Elections and Appointments.)

—Mr. Charles Bradley, of Newark, N. J., has been chosen by the New Jersey Legislature to be State Director of Railroads and Canals. This officer acts as a director, on behalf of the state, in the meetings of the boards of directors of railroads in which the state owns stock. The United Railroads of New Jersey appears to be the only or the principal road which comes under this head.

—Mr. L. B. Stillwell has been appointed Consulting Electrical Engineer of the Manhattan Railway Co., New York City, which is another indication that the electrifying of that system is soon to go forward. Mr. Stillwell entered the service of the Westinghouse Electric & Mfg. Co. in October, 1886, and was engaged in laboratory and expert central station work until 1891. In 1889 and 1890 he was sent to England and the Continent to study central station practice, and in April, 1891, was appointed Electrical Engineer of the Westinghouse Company. In 1895 he was appointed Electrical Engineer and Assistant Manager to the company, and at that time went to Niagara Falls to direct the installation of the Westinghouse machinery, which was largely of his own design. In 1897 he was made Electrical Director to the Niagara Falls Power Co., and held a similar position with the Cataract Construction Co. He is still retained as a consulting engineer to the Westinghouse company.

—Mr. W. H. Harrison, Superintendent of Motive Power, Trans-Ohio Division, Baltimore & Ohio Railroad, stationed at Newark, O., has resigned that position and retired from railroad work, as recorded week before last in our column of Elections and Appointments. Mr. Harrison is nearly 67 and feels that he has done his part in the world, and that he cannot in justice to himself assume the responsibilities of the motive power department of a great line. He served his apprenticeship with the Baltimore & Susquehanna Railroad, now the Northern Central Division of the Pennsylvania. He has worn out in service the original Baldwin locomotives, the Erie and Harrison engines, the "Coal Crab," the "Grass-hopper," "Mud Digger," "Winans Camel," and B. & O. 10-wheel "Camel" engines during 45 years of service with the Baltimore & Ohio. He feels that now he is entitled to take a rest, along with those old engines, and we are sure that many good railroad men will wish for him long life and happiness.

—Mr. G. R. Henderson, Mechanical Engineer Norfolk & Western Ry., has resigned his position with that road and goes to the Schenectady Locomotive Works. He will be in the Engineering Department, assisting Mr. Pitkin and Mr. Sague in designing new locomotives. He will assume his duties there March 20. Mr. Henderson began his railroad work with the Pennsylvania in 1878. He took a course in the West Philadelphia shops, and in 1881 was transferred to the Altoona drawing rooms, where he became Assistant Chief Draughtsman. In 1887 he went to Roanoke as Assistant Superintendent of the Roanoke Machine Works. From 1890 until the present time he has filled the duties of Mechanical Engineer of the Norfolk & Western Ry. He has been an active and useful member of the Master Mechanics' Association, having rendered valuable service in reports and discussions. He has also contributed occasionally to the Railroad Gazette and other journals, his work there having added to his professional reputation and contributed useful knowledge for the railroad profession.

—Sir Douglas Galton, K. C. B., died in England, March 10. He was a distinguished man of science, and an ornament to that highly accomplished body, the British Royal Engineers. He was born in 1822, was educated for the army and commissioned in the Royal Engineers in 1840, and retired from the active list of the army in 1875. He served his country in various public capacities—as Inspector of Railroads, as Secretary of the Railroad Department of the Board of Trade and as Under Assistant Secretary of State for War. For 25 years he was General Secretary of the British Association, and he served a term as President of that body. He had other honorable positions, and did other useful work; but we are chiefly concerned with his contributions to the art of train braking and to the world's knowledge of the laws of friction. In 1873 Sir Douglas, then Captain Galton, in co-operation with George Westinghouse, Jr., carried out the Galton-Westinghouse brake experiments, which have become classical. Mr. Westinghouse designed and constructed the automatic recording apparatus and doubtless laid out the scheme of experimentation. Captain Douglas Galton was chosen by the Institution of Mechanical Engineers (British) to direct the experiments. These two gentlemen worked together with great intelligence and skill, and their reports to the Institution established the facts, then hardly more than suspected, that the coefficient of friction rises as the speed of the wheels diminishes, and that the retarding effect is lessened the instant the wheels begin to slide on the rails. Thus, the Galton-Westinghouse experiments and reports were an original and important and permanent addition to man's knowledge of physical laws. Few men ever have the fortune to do so much as that.

ELECTIONS AND APPOINTMENTS.

Alabama Great Southern.—W. N. Cox has been appointed Acting Master Mechanic, succeeding C. Skinner, of Birmingham, Ala., resigned.

Atlantic, Valdosta & Western.—E. C. Spalding, Vice-President of the Atlanta, Knoxville & Northern, has been elected a Director of the A., V. & W. R. R.

Baltimore & Ohio.—E. T. White has been appointed Superintendent Motive Power, east of the Ohio River, with headquarters at Mt. Clare, Baltimore, Md., succeeding I. N. Kalbaugh, transferred. Effective March 15.

Chattanooga, Rome & Southern.—James Bonnyman has been appointed Civil Engineer.

Chicago & Northwestern.—This company has opened a freight and passenger agency at No. 106 North Fourth street, St. Louis, Mo., in charge of Geo. F. Brigham, Jr., General Agent.

Chicago, Milwaukee & St. Paul.—Frank E. King has been appointed Roadmaster of the Chicago Division. W. S. Howell has been appointed General Eastern Passenger Agent, with headquarters at No. 381 Broadway, New York City, succeeding Wm. Kelly, Jr., resigned.

Colorado & Southern.—John Forster has been appointed Division Master Mechanic, with headquarters at Denver, Col., succeeding J. J. Cavanaugh, resigned.

Dansville & Mt. Morris.—Robert H. England has been appointed General Manager, with headquarters at Dansville, N. Y.

Fort Worth & Denver City.—At the annual meeting of the stockholders held on March 7, the following officers were elected: President, F. Trumbull; Vice President, T. F. Dunaway; Vice-President and Traffic Manager, D. B. Keeler; Secretary and Treasurer, George Strong, and Auditor, S. M. Hudson. At the same meeting the following new Directors were elected: F. Trumbull, T. F. Dunaway, of Denver, Col., and D. B. Keeler, of Fort Worth, Tex.

Georgia Pine.—General Manager R. G. Stone has resigned, and the office of General Manager has been abolished. R. B. Coleman has been appointed General Superintendent, with headquarters at Bainbridge, Ga.

Great Northern.—A. C. Deverell has been appointed Superintendent of the Car and Machine Shops at St. Paul, Minn. S. F. Forbes has been appointed Purchasing Agent, with headquarters at St. Paul, Minn.

G. R. Martin has been appointed Auditor of Disbursements, succeeding J. L. Cramer, who has been appointed General Auditor, with headquarters at St. Paul, Minn.

Hocking Valley (successor to the Columbus, Hocking Valley & Toledo).—M. S. Connors has been appointed General Superintendent. The office of Superintendent has been abolished.

Illinois Central.—Robert Kirkland has been appointed Assistant General Freight Agent, succeeding G. W. Becker, transferred.

Jamestown & Chautauqua.—We are officially informed that General Manager C. R. Van Etten, has resigned, and that the office of General Manager has been abolished. C. M. Harrison has been appointed Superintendent of Operating Department. W. S. Allen has been appointed Auditor, succeeding A. G. Barrett, resigned, effective March 15.

Manistee & Grand Rapids.—J. W. Reading has been appointed Superintendent, succeeding A. D. Hart, resigned.

Nashville, Chattanooga & St. Louis.—Assistant Engineer W. H. Worley, with headquarters at Atlanta, Ga., has resigned.

New York & Pennsylvania.—General Manager J. B. Rumsey and Superintendent W. W. Crittenden, have resigned. D. N. Rumsey has been appointed General Superintendent and H. J. Rumsey, Auditor and General Freight and Passenger Agent.

New York Central & Hudson River.—W. T. McCulloch, heretofore General Manager of the Norfolk, Virginia Beach & Southern, has been appointed Auditor of Freight Accounts.

Norfolk, Virginia Beach & Southern.—B. P. Holland has been appointed General Manager. R. H. Pannill, General Passenger Agent, has resigned.

Ohio Southern.—Benjamin Norton has been appointed General Manager. Charles F. Franklin has been appointed Superintendent, with headquarters at Springfield, Ohio.

Pacific Coast Co.—J. C. Ford has been appointed Superintendent, succeeding L. E. Smith.

St. Joseph, South Bend & Southern.—The officers of this company are as follows: President, Moses L. Scudder; Vice President, Colgate Hoyt; Treasurer, Frank H. Carter, and Secretary, Harold Scudder. All of New York. Frank R. Hale has been appointed Superintendent, with headquarters at St. Joseph, Mich.

St. Louis & Northern Short Line (successors to the St. Louis, Peoria & Northern).—The headquarters of Chief Engineer, W. D. Taylor, have been removed from Springfield to Peoria, Ill.

St. Louis & San Francisco.—Thomas G. Hay has been appointed Passenger and Commercial Agent with headquarters at Monterey, Mexico.

Texas & New Orleans.—L. Mims has been appointed Roadmaster, with headquarters at Houston, Tex., succeeding P. Tulley, resigned.

Winona, Marshalltown & Southern.—The officers of this company referred to in the Construction column are: President, N. S. Ketchum; Vice-President and Treasurer, G. F. Kirby; Secretary, A. G. Glick; Chief Engineer, C. C. Gilman, all of Marshalltown, Ia. The Board of Directors include the above officers and E. S. Fonda of Osage, Ia.; A. A. Moore, Marshalltown, and E. B. Woodruff, Knoxville, Ia. Binford & Snelling of Marshalltown are the attorneys.

RAILROAD CONSTRUCTION, New Incorporations, Surveys, Etc.

ALASKA-YUKON RAILWAY & NAVIGATION.—This company was incorporated in New Jersey March 7, with a capital stock of \$125,000, to build a railroad from the mouth of the Unalaklik River, on North Sound, to a point on the Yukon River, at the mouth of the Kattag River. The incorporators are: James Read Girling and Oliver P. Hubbard, St. Michaels, Alaska, and Joseph V. Clark, Jersey City, N. J. This may be the same project several times mentioned in these columns for a cut-off from the ocean to the upper part of the Yukon. (Alaska Roads, Sept. 16, Nov. 11, 1898; Jan. 20, 1899; pp. 678, 820 and 52.)

ARKANSAS & CHOCTAW.—Grading is reported resumed on this line north of Texarkana, Tex., and it is proposed to continue the work until Atoka, Ind. Ter., is reached. The line, as projected, is to run from Choctaw City, Ark., west 130 miles, via, Doaks-ville, to Atoka. The bill has passed Congress authorizing the company to build its lines through Indian Territory. (Feb. 10, p. 107.)

ARKANSAS & OKLAHOMA.—This company has been reincorporated in Arkansas to build an extension from Gavett, on the Kansas City, Pittsburgh & Gulf, northwest 10 miles to the northwest corner of the state. The extension from Bentonville northwest 17 miles to Gavett was completed last year.

BALTIMORE & OHIO.—The Central Ohio division,

from Bellaire, O., to Cambridge, 53 miles, is to be double-tracked at a cost in the neighborhood of \$1,250,000. There are a number of heavy grades between Bellaire and Cambridge, which will be cut down, and all the bridges will be replaced with new double-track steel structures. At least a year will be required to complete the work. (Official.)

BRAINERD & NORTHERN MINNESOTA.—Preliminary surveys are reported completed for an extension from Bemidji, Minn., on the Great Northern, to run north 21 miles to Nevish to connect with the line of the Red Lake Transportation Co. The B. & M. built the extension to Bemidji last year.

BRECKENRIDGE SHORT LINE.—With reference to the rumored extension from Victoria, Ky., to Hartford, the General Manager writes that there is very little foundation for the report. There is a large territory lying between the two cities that needs development, and the people are extremely anxious for a railroad. The line was surveyed several years ago, and, with the exception of one heavy piece of work just out of Victoria, it can be built very cheaply, and would control a large coal and lumber business, but there is no immediate prospect of building.

BURLINGTON & MISSOURI RIVER.—This company, according to report, will build an extension from Alliance, Neb., southwest through Gerling and into Wyoming.

BURLINGTON, CEDAR RAPIDS & NORTHERN.—The Flick & Johnson Construction Co., of Davenport, Ia., is awarded the contract, according to report, for straightening the track between Cedar River, near Cedar Rapids, Ia., and Prairie Creek. About three-fourths of a mile of new track will be built, besides some deep rock cuts.

CENTRAL OF GEORGIA.—Options have been secured, according to report, for right of way for an extension from Eastpoint, Ga., six miles south of Atlanta, north to the Seaboard Air Line, which runs into Atlanta. The S. of G. now runs into that city over the tracks of the Southern.

CENTRALIA & EASTERN.—The incorporators are reported to have arranged for enough rolling stock and rails to put this road in working order, and it is expected that grading will be begun at an early date. The line as projected is to run from Centralia, Lewis County, Wash., on the Northern Pacific, east up the Salzer Valley, about eight miles. C. S. Gilchrist of Centralia is among the incorporators. (Feb. 24, p. 145.)

CHESAPEAKE & OHIO.—The company expects to carry out the improvements at Richmond, Va., which were planned some five years ago. It has not been definitely settled when the work will be begun. (Official.) Full account of these improvements appeared in the Railroad Gazette for October 9, 1896 (pp. 698-701).

CHICAGO & EASTERN ILLINOIS.—Surveys are reported completed for the extension of the St. Elmo Division from Marion, Ill., to Cape Girardeau and building is to be begun at once. (March 3, p. 161.)

CHICAGO & NORTHWESTERN.—Winston Bros., of Minneapolis, Minn., have the contract for a double track on this line. (March 10, p. 179.) The new work is to be as follows: Double track from Boone, Ia., to Ogden 7.4 miles; second track from Boone to Ontario, 8.9 miles; second track from Tama to Lamolille, 24.03, and second track from Missouri Valley to Council Bluffs, 21.5 miles. (Official.)

Land in Vesta Township, Minn., has been bought, according to report, for a town site. This may be for the proposed extension from Sanborn, Minn., northwest, or for an extension of the Redwood Falls branch from Redwood, which is 18 miles east. (Jan. 20, p. 52.)

CHICAGO, INDIANA & EASTERN.—Grading is to be resumed soon, according to report, on the extension from Swayzee, Ind., north to Converse. Rails were laid into Swayzee late last fall. (Nov. 4, p. 804.)

CHICAGO TERMINAL TRANSFER.—The company has secured an ordinance from Chicago Heights for building its proposed extension from Harvey, near Chicago, south nine miles to that city, and building is to be begun at an early date. (Dec. 16, 1898, p. 903.)

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—Within the next 30 days, according to report, the company will begin making improvements at Columbus, O. The work includes taking out a reverse curve and raising the tracks from the Scioto River.

COBOURG, NORTHERNBERLAND & PACIFIC.—Through its solicitor, Mr. W. R. Biddell, this company has made application to the Parliament of Canada for an act extending the time for beginning and completing the line to Dec. 31, 1901, and 1903, respectively; and to validate the issue of stocks and bonds heretofore issued. (Dec. 16, 1898, p. 903.)

COLUMBUS, MANSFIELD & NORTHEASTERN.—Meetings have been held at all the principal points along the proposed line of this road from Marshall, Mich., north about 140 miles, via Olivet, Kalamazoo, Vermontville and Alma to Bay City, and it is confidently expected that building will be begun early in the coming spring. H. E. Hollon, of Marshall, Mich., is President. (March 10, p. 179.)

DETROIT & SHORE LINE.—This company has been incorporated in Ohio as successor to the Toledo & Ottawa Beach. It will build a connecting road between Toledo and Detroit. All the grading in Ohio was reported completed last December. The Ferguson Contracting Co. of New York has the contract. Joseph K. Duffy of Toledo, O., is Vice President and General Manager.

EAST TENNESSEE & WESTERN NORTH CAROLINA.—President R. F. Hoke, of Raleigh, N. C., is quoted as stating that a charter has been secured to extend this line from Cranberry, N. C., southeast 70 miles to Lincoln, on the Seaboard Air Line, which would give the E. T. & W. N. C., a through line from Johnson City, Tenn., to Wilmington, N. C. It is stated that money is subscribed for the extension.

EVERETT & MONTE CRISTO.—Work has been resumed, according to report, in restoring this line, portions of which were washed out about two years ago.

FALLSBURG & MONTICELLO.—Bids will be re-

ceived, according to report, for building 2½ miles of this proposed line from Monticello, N. Y., north 5½ miles to Fallsburg. Surveys were completed some time ago. B. Van Steenberg, 53 Broadway, New York, is President, and C. W. Smith, Chief Engineer. (May 13, 1898, p. 348.)

FLORIDA CENTRAL & PENINSULAR.—This company is reported building a line around the east side of the city of Tampa, Fla., to connect with the line of Consumers' Electric Light and Street Co., which runs south about 30 miles to Palmetto Beach.

GLADEVILLE.—Grading is reported begun on three miles of this line from Ramsey, Va., on the Norfolk & Western, north to Wise C. H. The company proposes to extend it ultimately into Kentucky. Emil Low, of Saltville, Va., is Chief Engineer. (Jan. 13, p. 33.)

GREAT NORTHERN.—Grading has been completed for considerable distance and will be pushed as rapidly as the season permits, on the Coon Creek cut-off, from Coon Creek, Minn., north to Brook Park, about 50 miles. The intervening stations from Coon Creek north are: Andover, Cedar, Bethel, Isanti, Cambridge, Stanchfield, Braham, Grasson and Cornell. Holey Bros. of St. Paul, Minn., have the contract. (Dec. 2, 1898, p. 867.)

GULF, LOUISIANA & GREAT NORTHERN.—W. S. Boody, General Manager of the Wheeler & Boody Co., railroad contractors, 222 South Third St., Philadelphia, who have a contract for building this road, announces that active work will be begun at Pineville, north of Alexandria, La., at once. The line, as projected, is to run from Vermilion Bay on the Gulf of Mexico, north via Alexandria and Arcadia from the state line of Louisiana to the Arkansas state line. Joseph J. Waitz, of Alexandria, is President and General Manager. (Dec. 16, 1898, p. 903.)

ILLINOIS CENTRAL.—Reports from Champaign, Ill., state that the yards at that point are to be considerably enlarged and made to cover the site of the old hotel and station destroyed by fire.

KNOXVILLE & BRISTOL.—Representatives of the stockholders have been touring East Tennessee, seeking encouragement from the people for the proposed extension of its line north and south through Bristol and to Knoxville. The company is successor to the Morristown & Cumberland Gap. (Aug. 5, 1898, p. 571.)

LAKE ERIE & WESTERN.—The General Manager confirms the report that the Ohio Northern will make some improvements this season. These will consist of filling in bridges and some permanent work, but in no unusual nor large amount. (March 3, p. 161.)

LEETONIA.—This company has been incorporated in Pennsylvania, with a capital stock of \$100,000, to build a line eight miles long in Tioga County. C. B. Farr of Williamsport, Pa., is President. Mr. Farr is also President of the Tiadaghton & Fahnstalk line running southwest to Tiadaghton, and the company may be for the purpose of connecting Leetonia with that road.

LOUISVILLE & NASHVILLE.—Surveys are reported in progress for the proposed extension north from Sylmer, Ala., to Blocton, about 60 miles. This line with the 40-mile gap now building at Pineapple, Ala., and Repton, would give the L. & N. another independent line from Birmingham. (Jan. 20, p. 53.)

MANISTIQUE & NORTHWESTERN.—This company has filed a map for an extension of its line in Schoolcraft County, Mich. Action will be taken by the Michigan Board of Railroad Crossings on March 21.

MICHIGAN ROADS.—Surveys are reported in progress for the proposed logging road of E. Crawford & Sons, of Pigeon, Pa., which is to run from Cedar River, Menominee County, Mich., northwest about six miles. The line may ultimately be extended to the Chicago & Northwestern. (Aug. 5, 1898, p. 571.)

MINERAL RANGE.—Maps have been approved by the Michigan Board of Railroad Crossings for an extension of this line in Houghton County to the Arcadian line and Franklin Stamp Mill.

MONTANAN.—Surveys are reported in progress for an extension of this road from Leadboro, Mont., northeast about 80 miles through Judith Gap to Lewistown. The line now runs from Lombard, on the Northern Pacific, northeast 56 miles to Leadboro.

NEVADA-CALIFORNIA-OREGON.—Twelve miles of track is reported laid on the extension from Amadee, Cal., west about 20 miles to Susanville. (Feb. 24, p. 146.)

NEW JERSEY ROADS.—Surveys are in progress for a line from Morristown, N. J., to run northeast through Collinsville, Malapardis, Whippany, Troy Hills, Hanover Neck, Hanover, Livingston, Roseland, Essex Fells, Westville and Fairfield to Little Falls. It is stated that grading will be begun about April 15. The line when completed may be known as the Greater New York Belt. Chas. D. Haines of 100 Broadway, New York, and John E. Melick of Morristown, N. J., are among those interested.

NEW YORK, ONTARIO & WESTERN.—Grading is reported begun on the Scranton Division from Peckville, Pa., to the Capouse Colliery in the Keyser Valley, 4½ miles long. Burke Bros., of Scranton, Pa., have the contract for stone work, and the grading is being done by the company. (March 10, p. 180.)

NORTH CAROLINA ROADS.—H. F. Schenck, President of the Cleveland Cotton Mills at Laundale, N. C., writes that his company has determined to build a private railroad from the mills at Laundale south 10 miles to Shelby, to connect with the South Carolina & Georgia. Surveys will be begun in about a month and the company hopes to complete the line during the summer. Very few of the details have as yet been determined. (March 3, p. 161.)

NORTHWEST.—Grading is reported begun on this line through Huntington, Ore., north down the valley of the Snake River, 55 miles to Oxbow and Ballard's Landing, in the Seven Devils mining district. Orman & Crook of Pueblo, Col., have the contract. Isaac E. Blake, 11 Broadway, New York, is President. (March 3, p. 161.)

PENNSYLVANIA.—W. W. Caldwell, of Philadelphia, lessee of F. L. Brown & Co., has taken the contract for excavating and building the west end

of the improvements at Irwin, Pa. This will affect about three miles of road, on which there will be a cut about one mile in length and a portion of the track raised 30 ft. above its present level.

PEORIA, DECATUR & EVANSVILLE.—The General Manager will lay 20 miles of 70-lb. steel, displacing 52-lb. rails. (March 10, p. 180.)

PONTIAC PACIFIC JUNCTION.—The Provincial Legislature at the recent session extended the time for certain extensions to be completed and certain subsidies earned, to Dec. 31, 1899. (March 10, p. 180.)

RIO GRANDE WESTERN.—The Chief Engineer confirms the report that Deal Bros. & Mendenhall of Springville, Utah, have the contract for building the first six miles of the extension from Provo City, Utah, northeast 15 miles toward Heber City. An additional nine miles was to be let last week. Most of the grading is canyon work. The maximum grade is 2 per cent., and the maximum curve 12 degrees. About one mile of grading is completed. (March 10, p. 180.)

RUTLAND.—Grading is reported in progress on the Rutland-Canadian extension from Burlington, Vt., north about 60 miles through Grand Isle to Alburgh. About 150 men are at work, and the contractors, O'Brien & Sheehan, of New York City, expect to have many more at work by April 1. (Feb. 17, p. 132.)

SABINE PASS & NORTHWESTERN.—W. H. Brooker, of Greenville, Tex., one of the chief promoters of this road, is reported as saying that arrangements are completed for building the section of the road south of the main line of the Texas & Pacific, in Van Zandt County, and that they are seeking for the most practical route from that point north to the Red River. This line as projected is to run from Sabine Pass, Tex., northwest 300 miles through Livingston, Palestine, Groveton, Athens, Canton and Greenville to the Red River. (Nov. 18, 1898, p. 839.)

ST. JOHN VALLEY RIVER.—This road has completed arrangements to be taken over by New York capitalists. It runs along the left bank of the St. John River from Fredericton, N. B., County Woodstock, paralleling a road on the opposite bank, operated by the Canadian Pacific. It has been surveyed, more than half of the right of way secured, and about five miles graded. The new owners say that construction will be begun as soon as spring opens and the line pushed to completion. It is thought to be an outlet for the Grand Trunk via the Temiscanata road and the continuation of the St. John Valley Line from Fredericton to St. John, about seventy miles through a well settled country.

ST. LOUIS & NORTHERN SHORT LINE.—Surveys are practically completed for the connecting line from Marine, Ill., south about 58 miles to Sparta on the Mobile & Ohio. (Jan. 13, p. 33.)

SAN ANTONIO & GULF.—President Brackenridge is quoted as stating that the company intends to extend the line east to Galveston, Tex., about 200 miles, at an early date. The road is successor to the San Antonio & Gulf Shore, and was completed a few months ago from San Antonio, Tex., east 38 miles to Stockdale.

SAN FRANCISCO & SAN JOAQUIN VALLEY.—Preliminary surveys have been made at Stockton, Cal., to connect this road with the Southern Pacific, which will require about 1½ miles of track.

SAVANNAH & STATESBORO.—Grading is reported in progress for the extension of this line from Woodburn, Ga., northwest about 20 miles to Statesboro. The company is successor to the Cuyler & Woodburn, and operates a line from Cuyler northwest 14 miles to Woodburn. Fred. Pitts, of Alabama, has the contract and about 350 men are at work.

SISTERSVILLE, PENNSBORO & BURNSVILLE.—Contracts will be let before April 1, according to report, for the first work on this proposed line from Sistersville, W. Va., south via Pennsboro to Burnsville, on the West Virginia & Pittsburgh. Final surveys have been made from Sistersville to Central Station, 35 miles, and are nearly completed to Troy, 30 miles more. It is proposed to begin grading April 15. L. P. Wilson is President, and R. C. Venable Chief Engineer, both of Pennsboro, W. Va. (Dec. 30, 1898, p. 938.)

SMETHPORT.—This company was incorporated in Pennsylvania, with a capital stock of \$90,000, to build a line nine miles long connecting the Kushequa and the Western New York & Pennsylvania. The directors are Elisha K. Kane (President), R. B. Cody, C. D. Lamb, N. C. Cody and A. E. Foster, Kushequa, Pa., and F. D. Gallup and J. W. Bouton, Smethport. The Smethport Borough Council has granted right of way down Water St., in that borough, for this line.

SUMPTER VALLEY.—President Eccles of Ogden, Utah, is quoted as saying that this line, which now runs from Baker City, Ore., to Sumpter, 32 miles, is to be extended southwest from Sumpter into the Hartney County stock region.

TERMINAL ASSOCIATION AT ST. LOUIS.—The St. Louis city committee on railroads, has under consideration a bill authorizing this company to build a switch along Moore St. from Clark Ave. to Market St. (Nov. 25, 1898, p. 853.)

TEXAS CENTRAL.—Surveys are begun, according to report, for the proposed extension from Albany, Texas, northwest about 40 miles, and the company proposes to begin building as soon as surveys are completed. (Jan. 6, p. 16.)

UNION STATION.—This company was incorporated in New York, March 14, with a capital stock of \$60,000, to build an elevated steam railroad six miles long, from Main St., Buffalo, southeast to Winchester. The directors are: Lewis Stockton, William C. Cornwell, H. Littell, Fred C. M. Lautz, George Urban, Jr., T. Guilford Smith, Frank B. Baird, F. H. Goodyear and W. Caryl Ely.

VIRGINIA ROADS.—An official of the Southern writes that a lumber company is considering building a road from Stuart, Va., in the direction of the Dan River. The Southern has no connection with the enterprise and the official does not think that it has taken any definite shape.

WARREN & ONTICHTA VALLEY.—This company was incorporated in Kansas March 8, with a capital stock of \$35,000, to build a line from Warren, Bradley

County, to a point in the Morro Valley, a distance of 15 miles. This valley lies to the west of Warren.

WEST VIRGINIA CENTRAL & PITTSBURGH.—An official writes that there is nothing in the report that the company is to improve its terminal facilities at Cumberland, Md. (March 10, p. 180.)

WEST VIRGINIA ROADS.—S. M. Manifold, General Manager of the York Southern at York, Pa., has been in West Virginia investigating the feasibility of a route for a railroad for some Philadelphia gentlemen. The company has as yet no name and has taken out no charter. Nothing definite is yet determined.

WINONA, MARSHALLTOWN & SOUTHERN.—The proposed route of this company is from Osage, Ia., the southern terminus of the Winona & Southern, to run south 170 miles through Allison, Grundy, Marshalltown, Newton and Knoxville to Chariton. The object is to tap the coal fields of Jasper, Marion and Lucas counties. (March 3, p. 162.) The officers are given under Elections and Appointments (official).

WISCONSIN MICHIGAN & NORTHERN (successor to the Wisconsin & Michigan).—Maps have been filed by this company showing the proposed extension north from Faithorn Junction, Mich., in Menominee and Dickinson counties. Action will be taken by the Michigan Board of Railroad Crossings on March 21. (Oct. 7, p. 732.)

Electric Railroad Construction.

ALTON, N. H.—An act to incorporate the Alton & Gilmanton Electric Ry. Co. was approved March 11. The proposed stock will be about \$50,000, and the company proposes to build an electric railroad about 12 miles, between Alton and Gilmanton. The incorporators are: William R. Clough, John Collins, Lafayette Woodman, Laban G. Welch, George H. Demeritt.

BRIDGETON, N. J.—The Board of Directors of the Bridgeton & Millville Traction Co., at a meeting March 7, decided to build the 4½-mile extension to Cedarville from Fairton, and Walter H. Bacon, Treasurer of the company, has been instructed to let contracts for the work. (Feb. 17, p. 132.)

BRISTOL, R. I.—The contract for building the road from Bristol to Mt. Hope Park for the Bristol Land & Improvement Co. has been let to Biber, White & Co., Boston, Mass., at \$39,800. Entire right of way has not as yet been granted. (Nov. 4, p. 805.)

CAMBRIDGE CITY, IND.—R. Kenna informs us that the name of the company in which he is interested and which proposes to build 25 miles of road between Cambridge City, East Germantown and Hagerstown is the Cambridge City Inter Urban Traction Co. It is an entirely new project, and contracts will probably be let the early part of July. It is proposed to have a power plant of 500 h. p. Six closed motor cars, six open and four closed trailer cars is the proposed equipment, and contracts will be let for these with other contracts. (March 3, p. 162.)

CANANDAIGUA, N. Y.—The Canandaigua Electric Light & RR. Co. will, according to report, make additions to the service during the present season. H. B. Ferguson, Manager and Purchasing Agent.

CHESTER, N. H.—An act to incorporate the Chester & Exeter St. Ry. Co., with a capital stock not to exceed \$200,000, was approved March 11. The road the company proposes to build is from Chester, about 27 miles east to Exeter. The incorporators are: William H. C. Follansby, George A. Wentworth, Russell H. Fellows, Joseph R. Rowe, Stephen A. Frost.

CHICAGO, ILL.—On March 8 the Drainage Board gave permission to the Chicago & Desplaines Valley Electric Ry. to lay tracks over the Sanitary District property along the Lyons road, in the village of Summit, between the Illinois & Michigan Canal and the Desplaines River, with privilege of crossing the main channel at Summit. The electric road is to pay compensation and share the cost of flagmen at the bridge. This company was incorporated last June to build an electric railroad from Lyons to Chicago. It is capitalized at \$100,000, and Henry B. Fargo, of Geneva, and Hiram A. Johnson and H. W. Percell, of Chicago, are among the incorporators. (June 10, 1898, p. 421.)

The Lake St. Elevated has practically completed the lowering of its elevated structure at West Forty-second St., and within six weeks the incline will be completed and trains running direct from the city to Oak Park. Work in the incline from Willow Ave. to Fifty-second St. will now be pushed, as this must be completed and trains running by April 15.

The Chicago, Wheaton & Aurora RR. Co., which was recently incorporated, has a capital stock of \$10,000, and proposes to build an electric railroad between the places named in the title. The incorporators are: Andrew J. Hirsch, James Rosenthal, Lessing Rosenthal, Milton A. Strauss and Leon A. Strauss.

CINCINNATI, O.—The Tennis Construction Co., of Philadelphia, has been awarded the contract for building the 40 miles of road for the Cincinnati, Lawrenceburg & Aurora Electric St. Ry. The C., L. & A. was incorporated last November, with a capital stock of \$10,000, which has since been increased. There will be 2 power houses, each equipped with two 500 horse-power Hamilton-Corliss engines, two 400 kilowatt Westinghouse generators, and four 250 horse-power tubular boilers. Besides building the road and the power houses, the contract requires the Tennis Co. to furnish the rolling stock. J. C. Hooven, President of the Hamilton-Corliss Engine Works, Hamilton, O., Geo. H. Helvey and Fred D. Shaefer are among those interested in the company. The Hamilton County Commissioners have granted a franchise and right of way for 25 years from Anderson's Ferry to the Indiana State line. (Nov. 4, 1898, p. 805.)

CLAREMONT, N. H.—The Claremont St. Ry. Co. has been incorporated, with a capital stock not to exceed \$100,000, to build an electric railroad in the town of Claremont. The incorporators are: Russell Jarvis, Hira R. Beckwith, J. F. Emerson, Oscar B. Rand, Charles H. Weed.

CLEVELAND, O.—On March 2 the Cleveland & Warren Electric Ry. Co. was incorporated, with a

capital stock of \$10,000, with the right to increase the capital to a larger amount. Among the incorporators are: Hon. Martin Dodge, C. B. Lockwood, J. E. Phelps of Chagrin Falls, C. E. Thorp, Maysmills, and J. B. Corlett. The intention of the company is to build a line 50 miles long, passing through the counties of Cuyahoga, Geauga, Portage and Trumbull. The temporary officers are: President, J. W. Conger; General Manager, Martin Dodge.

CORNWALL, ONT.—According to report, the Cornwall Electric St. Ry., which was recently foreclosed by the Sun Life Insurance Co. of Canada, will make extensive repairs and additions and renewal of machinery in the power houses. (Feb. 10, p. 111.) J. Metford Taylor is operating the property.

DAYTON, O.—At a special meeting of the City Council March 8, the Dayton & Easton Traction Co., represented by Henry E. Pruden and Albert Emanuel, was granted a franchise east and west along Main St., and south through Xenia. Messrs. Pruden and Emanuel are two of the incorporators of the Xenia & Wilmington Traction Co., mentioned below under Xenia, O.

DERRY, N. H.—The Derry & Pelham Electric Ry. Co., which was incorporated Feb. 1, has a capital stock of \$200,000, and proposes to build an electric railroad from Derry through Londonderry and Windham to Pelham. The incorporators are: William H. Anderson, Frank M. Woodbury, George C. Jackman, George H. Atkinson, George S. Butler.

EASTON, PA.—The Northampton St. Ry. Co., which was chartered March 3, proposes to build a 12-mile electric railroad in Northampton County, connecting Seipville and Nazareth. Chas. A. Richardson is President. (Wilmington, March 10, p. 181.)

EAU CLAIRE, WIS.—Plans are being considered for an extension of the Eau Claire & Chippewa Falls Electric Ry., 10 miles north to Bloomer, and 15 miles from Bloomer to Long Lake, a popular summer resort.

EVANSVILLE, IND.—Articles of incorporation of the Evansville & Southern Ry. Co. were filed by W. C. Henning of Dayton, O., March 9. This company is to have a capital stock of \$50,000. The route was given in this column Feb. 24, (p. 146). W. L. Caten, R. L. Worrell and Mr. Henning are among the incorporators. (Jan. 27, p. 74.)

FLINT, MICH.—A. A. Talmage & Co., New York, are about to incorporate the Michigan St. Ry. Co., and the Michigan Heat, Light & Power Co., each with a capital stock of \$25,000, the minimum amount allowable in Michigan. The ultimate capitalization of the company will probably be about \$10,000,000. This company has secured nearly all necessary right of way and franchises for 85 miles of electric railroad. The road will begin at Flushing, Shiawassee County, running southeast 12 miles through Genesee County, to Flint, which will be the headquarters of the company; then the road will parallel the Flint & Pere Marquette RR. to Grand Blanc, where two branch lines will be built, one running east to Atlas, the other southwest to Fenton, via Long Lake, probably needing three bridges. From Atlas it is intended eventually to build a line through to Pontiac and connect with an electric railroad to form a continuous line to Detroit. With trackage arrangements with other roads now in operation and building, this new road will pretty well cover the territory between Bay City and Detroit. In Flint about six miles of road will be built to give a local service. The company will do its own building. H. A. Lloyd is President pro tem. Other persons interested are A. A. Talmage, R. D. Talmage and Wm. J. Schaefer. (March 10, p. 181.)

GENEVA, MINN.—S. Svendsen, Town Clerk, informs us that among the persons interested in the project to build an electric railroad from Geneva, 6 miles southwest to Albert Lea, and about the same distance to Owatonna, are L. P. Lawson, Geo. Gay, Frank E. Schad, John T. Robson and others.

GILMANTON, N. H.—The Gilmanton & Barnstead Electric Ry. Co. was incorporated Feb. 15, with a capital stock of \$50,000, to build an electric railroad about 10 miles long, between the places named. The incorporators are: Thomas Cogswell, Hiram A. Tuttle, Sherburne J. Winslow, George E. Kent, Charles E. Walker.

HAMILTON, ONT.—According to report, the Hamilton, Grimsby & Beamsville Electric Ry. has been petitioned to build a five-mile extension southeast from Beamsville to Vineland.

HARVARD, ILL.—The Continental Construction Co. of Boston, Mass., has the general contract for building the 12 miles of road for the Chicago, Harvard & Geneva Lake Ry., between Harvard, Foutona and Lake Geneva, which is to be completed and in operation by June 1. W. H. Ward, of Harvard, has about finished building the power house at Walworth. The cars have already been bought from Jackson & Sharp. The Illinois Steel Co. has the contract for 12 miles of 60-lb. rails. This road will carry both freight and passengers. H. H. Windsor, Old Colony Building, Chicago, is President and Secretary; H. N. Bates, Vice-President, and H. T. Windsor, Treasurer and Superintendent. (Feb. 10, p. 109.)

HOOSICK FALLS, N. Y.—The Bennington & Hoosick Valley Ry. Co., March 14, filed with the Secretary of State a certificate for extensions of the road to connect the towns of North Hoosick, Johnsonville, Valley Falls and Stillwater, Rensselaer County. It is proposed to connect with the Mechanicsville & Stillwater Ry. Co. at Stillwater, and to connect with the Troy City RR. in Lansingburgh. Geo. E. Greene, President. (April 1, 1898, p. 246.)

HUDSON, N. H.—The Hudson, Pelham & Salem Electric Ry. Co. has been incorporated with a capital stock of \$200,000, to build and operate an electric railroad from Hudson through Pelham, Windham and Salem, to a point near the state line in Ayre's Village. The incorporators are: Charles H. Burke, Nathaniel Wentworth, Charles S. Collins, Kimball Webster, John J. Baker.

INDEX, WASH.—N. Rudebeck, of Everett, with others, proposes to build an electric railroad from Index to mines in the vicinity, and have it finished within one year.

KEENE, N. H.—The act to increase the capital stock of the Keene Electric Ry. Co. by \$20,000 was approved March 7. The time for completing this road has been extended to March 31, 1902.

KERN CITY, CAL.—According to report, money has been secured for the proposed electric railroad between Kern and Bakersfield, estimated to cost \$60,000. H. F. Williams, a city trustee, is interested. (Feb. 24, p. 147.)

KNOXVILLE, TENN.—The Knoxville Traction Co. will soon begin work on the new line on Central Ave., from the present line on Broadway to Lonsdale. Considerable work is now in progress on improving the West Knoxville lines. The Clinch St. line will also shortly undergo improvements. C. C. Howell, Mgr. (Sept. 23, 1898, p. 697.)

KOKOMO, IND.—Chas. L. Harry, former receiver of the Kokomo City St. Ry., has been granted right of way by the Marion County Commissioners for an electric railroad over the Allisonville road within the county limits. The road Mr. Harry proposes to build is 25 miles long, between Tipton and Kokomo. Geo. F. McCulloch, of the Muncie St. Ry., is associated with Mr. Harry. (Jan. 20, p. 54.)

LOS ANGELES, CAL.—Among the improvements proposed by the Los Angeles Ry. is a second track on Pico St., from Figueroa St. to Millard Ave., a distance of 7,037 ft.; a single track on Ninth St. from Central Ave. to Main St., 4,733 ft.; a single track on Los Angeles St. from First to Aliso St., 2,020 ft., and Aliso St. to the river, 2,730 ft.; on Bridge St. and Brooklyn Ave., 9,380 ft.; in all about 5 miles of new track. The company recently filed a mortgage for additional funds to make these improvements. (March 3, p. 162.)

LOS GATOS, CAL.—The Town Council has been petitioned for a franchise for an electric railroad to San Jose, proposed by E. N. Davis.

MAGNOLIA, MASS.—According to report work will be begun in May on the 4½ miles of road to Gloucester, to be built by the Magnolia St. Ry. W. B. Ferguson, of Malden, with post office address at 53 State street, Boston, Mass., is the principal stockholder. No contracts as yet have been let. (Feb. 17, p. 133.)

MANCHESTER, N. H.—The Manchester St. Ry., on March 1, was granted permission to extend its line to the village of Guffstown. (March 3, p. 163.)

MEREDITH, N. H.—The Meredith & Ossipee Electric Ry. Co., which was granted a charter by the State Legislature Feb. 1, has a capital stock of \$200,000. The plan of this company is to build an electric railroad from Meredith through the towns of Center Harbor, Moultonborough, Sandwich and Farnsworth to Ossipee, N. H. The incorporators are: James E. French, George W. Armstrong, J. Alonzo Green, Henry F. Dorr, Joseph W. Lang. (Feb. 10, p. 110.)

MILFORD, N. H.—The Mt. Vernon & Milford Electric Co., which was incorporated Feb. 15, has a capital stock of \$50,000, and proposes to build a five-mile electric railroad between the places named. The incorporators are: Franklin Marden, John A. Spaulding, John McLane, Clark Campbell, George A. Marden. (Feb. 10, p. 110.)

MINNEAPOLIS, MINN.—According to report, Mandelbaum & Co., of Cleveland, O., have secured a franchise in Stillwater for the road between Minneapolis and Fort Snelling. (Feb. 10, p. 110.)

MONTREAL, QUE.—The Montreal St. Ry. Co. has been granted permission to increase its capital stock by \$5,000,000. A clause was inserted in the bill compelling the company to issue workmen's tickets at 10 and 12 for 25 cents, good between five and nine a. m., and five and eight p. m. Several extensions are planned. The Cote des Neiges extension has been completed as far as Pine Ave. (Feb. 10, p. 110.)

MONTVILLE, CONN.—The Montville Ry. Co. has a petition before the Legislature for amendments to the charter to build a 13-mile road north and south to Norwich and New London, and use electricity for motive power. Solomon Lucas is representing the company.

NEW BRITAIN, CONN.—The Central Ry. & Electric Co. is planning for a five-mile extension south from Plainville, paralleling the New York, New Haven & Hartford, to Southington. This company also proposes to connect with the Southington & Plantsville Tramway Co., which was recently purchased by the Meriden, Southington & Compounce Trolley Co. (Meriden, Dec. 16, p. 905.)

NIAGARA FALLS, ONT.—Many improvements and repairs, according to report, are to be made on the Niagara Falls Park & River Ry., as soon as the frost is out of the ground. W. Phillips, Manager, has submitted a report of inspection of the road to the Government, and the improvements are ordered on his suggestion.

NORFOLK, VA.—The Tennis Construction Co., E. A. Tennis, President, Philadelphia, Pa., has the contract for building the Norfolk & Sewell's Point Electric RR. This road will be 18 miles long, extending north from Norfolk to Sewell's Point. The same company will build the power house and car sheds and furnish the equipment for the road, including 10 cars, two 350 horse-power Hamilton-Corliss engines, 300 kilowatt Westinghouse generators, and four 200 horse-power tubular boilers. The cars will be built for a speed of 40 miles per hour. Work is to be begun in time to be completed Aug. 1.

NORWICH, CONN.—The Norwich St. Ry. Co. is planning for an extension of the tracks from its terminus on West Thames street to the city line.

NORTH WALPOLE, N. H.—The North Walpole & Acworth St. Ry. Co. has been incorporated to build an electric railroad from North Walpole through Langdon, Alstead and Acworth to Lemper, N. H. Its capital stock is not to exceed \$160,000. The incorporators are: Charles J. O'Neill, H. A. Perry, William H. Kiniry, H. H. Buzzell, P. E. Griffin.

PEORIA, ILL.—Negotiations have been completed by Tucker, Anthony & Co., Boston, Mass., whereby they will build and finance the Peoria & Pekin Traction RR., which will be 10 miles long, between Peoria and Pekin, using both electricity and steam-electricity for passenger traffic and steam for heavy freight traffic. Bonds of this company amounting to \$600,000 have been sold. The Pennsylvania Steel Co. has a contract for 1,200 tons of rails. The power-house will be located midway between Peoria and Pekin, and it is proposed to put in three engines of 325 h. p. each, and room will be provided for a 650 h. p. engine as an auxiliary engine. The company

has a 50-year traffic agreement with the Central St. Ry., of Peoria, which road controls all the surface lines in that city. It is stated that the new road will be completed by June. The roadbed has already been graded. At a meeting, March 6, the following officers were elected: Theodore J. Miller, of Peoria, President; W. T. Trumbull, Salem, Mass., Vice-President; Louis E. Myers, Peoria, Secretary and General Manager, and P. S. Saltonstall, Boston, Mass., Treasurer.

PETERSBURG, VA.—The persons applying for the franchise for the Richmond & Petersburg Electric Ry. Co., on the Petersburg Turnpike, are John C. Short and Joseph Parker, of 27 William street, New York; F. Beach, Geo. L. Catlin, John S. Primrose and J. G. B. Woolworth, also of New York; C. M. Mahoney and Merriwater Jones, of Richmond, Va. according to the survey which is completed, the road will be 20 miles long. (March 10, p. 181.)

PHILADELPHIA, PA.—The Philadelphia & Westchester Traction Co. and the Philadelphia, Castle Rock & West Chester are planning an extension on Gay St., westward from Matlack to High St., to connect with the West Chester St. Ry.

PHOENIXVILLE, PA.—The Montgomery & Chester Electric Ry. Co. will soon begin work on the 15 miles of line between Pottstown and Phoenixville. Sixty-pound rails are now being distributed along the route. The company has recently secured additional funds by giving a mortgage security. (See Electric Railroad News column, Jan. 27, p. 74.)

PLAINFIELD, N. J.—L. W. Serrall, of Plainfield, has the contract for building the extension of the Plainfield St. Ry. to Scotch Plains. (Jan. 20, p. 54.)

Col. Edwin W. Hine, representing the capitalists who are projecting the Westfield & Elizabeth St. Ry. between Elizabeth and Plainfield, and who own the Plainfield St. Ry., has made application in Rahway for a franchise for a proposed branch line from Westfield to Rahway. A hearing has been set for March 31, (Feb. 10, p. 110; March 10, p. 181.)

PORT HURON, MICH.—The City Electric Ry. has been granted a 30-year franchise by the City Council for an extension of three miles along the river. Wm. Canham, President.

POTTSVILLE, PA.—The Coal Castle Electric Ry. Co. was chartered March 10 to build a line 2 miles long in Schuylkill County. The capital stock is \$30,000. The Directors are: R. Steen Martin (President), John M. Emery, Norman A. Saylor, Chas. L. King, L. B. Bane and Joseph Brobston, Philadelphia.

REDLANDS, CAL.—Henry Fisher, President of the Redlands St. Ry. Co., informs us that it is proposed to change the three miles of mule car line now in operation to electric and build one mile additional. Bids will be asked in about two months on 60-lb. rails and two closed motor cars. They propose to rent power from the Redlands Electric Light & Power Co. The officers of the company are: President, Mr. Fisher; Vice-President, O. H. Childs; Secy., Mgr., Supt. and Purchasing Agent, J. H. Fisher; Treasurer, the First National Bank of Redlands, and Electrician, O. H. Ensign. (Feb. 24, p. 147.)

RICHMOND, IND.—The Richmond Inter Urban RR. Co. has been incorporated and franchises have been secured from the city for an electric line to be built in the cities of Richmond, Centerville, East Germantown, Cambridge City and Dublin. The capital stock is \$10,000 and some of the incorporators are: John H. Rolling, W. K. Bradbury, John W. Barnett, Benjamin Wissler and Benjamin Starr, of the Starr Piano Co.

ROME, N. Y.—We are officially informed that the syndicate of New York bankers who have purchased the Rome City St. RR., which has heretofore been operated by horses, will entirely re-equip it with new ties and rails, and with compressed air motors. Henry D. Cooke and Chas. R. De Freest, former Secretary of the New York Railroad Commissioners, are representing the syndicate in making plans and arrangements for the reconstruction, extension and equipment of the road. Information can be had from A. W. Soper, 160 Broadway, New York. (March 10, p. 181.)

ST. LOUIS, MO.—The syndicate represented by Brown Bros., who have bought the Peoples Ry., the Union Depot Ry., the Lindell Ry. and the Missouri RR., intend, according to report, to lay about 50 miles of track in addition to the 180 miles already owned by them. Franchises owned by several of the absorbed companies permit the extensions. Gilson J. Coleman, formerly of Allentown, Pa., has been made Consulting Engineer for the proposed new work.

SEA CLIFF, L. I., N. Y.—A certificate of incorporation of the Nassau County Ry. Co. was filed March 13. The company proposes to build an electric street railroad from the Sea Cliff Station of the Long Island RR. 1½ miles to the steamboat landing in the village of Sea Cliff. The capital stock is \$25,000. Among the incorporators are: Wm. F. Brown, 482 Decatur St., Brooklyn, and Francis L. White, Summit, N. J. The principal office of the company will be in the Borough of Manhattan.

SEATTLE, WASH.—An ordinance is before the City Council authorizing Winthrop Smith, Albert Stone and Andrew F. Burleigh to build a street railroad in Seattle, and also to carry freight as well as passengers. The road must be operated by electricity.

The Seattle & Tacoma Electric RR. Co. filed articles of incorporation March 6. The capital is to be \$1,000,000, and the incorporators are John Collins, Chas. W. Slater, J. F. Eshelman, George A. Burch and Anthony Corcoran, of Seattle, and Henry Bucey and H. E. Knavold, of Tacoma. It is proposed to have the road in operation not later than Nov. 1. (Tacoma, March 3, p. 163.)

Former Corporation Counsel John K. Brown has petitioned the city, as attorney for Richard Chilcott, for a franchise for an electric railroad on Fifth Ave. South, Connecticut St. and Railroad Ave. to the city limits. It is estimated that \$100,000 will cover the cost of building this road. The most extensive single item would be a drawbridge over the Duwamish River at a probable cost of \$30,000.

SHERBROOKE, ONT.—The property and franchises of the Sherbrooke St. Ry. Co. have not been sold, as reported two weeks ago, and no change in the management or directorate has been made. No

extensions are contemplated this season. (March 3, p. 163.)

SHERMAN, TEX.—The Sherman Construction Co. has been incorporated, and, according to report, will build a 10-mile electric railroad to Denison.

SIOUX CITY, IA.—The Central Traction Co. has filed a mortgage with the Sioux City Safe Deposit & Trust Co. to secure an issue of five per cent. five-year bonds for \$30,000, to be used in making improvements on the road. This company is capitalized at \$150,000, and this is the first issue of bonds.

STREATOR, ILL.—The La Salle County Ry. Co., which was incorporated a year ago to build an electric railroad to connect Streator, Ottawa, La Salle and Spring Valley, has made applications for franchises through these towns. C. H. Rathburn and W. H. Bols are interested. The capital stock is \$500,000. (Feb. 25, 1898, p. 149.)

SYRACUSE, N. Y.—According to report the Syracuse Construction Co., which controls the Syracuse, Lakeside & Baldwinsville Ry., has awarded a contract to Kirk, Driscoll & Co. for building the road. (Feb. 17, p. 133; March 3, p. 163; March 10, p. 181.)

Plans are said to be in consideration by the Syracuse Rapid Transit Co. for an extension through the North Side to the cemetery.

TACOMA, WASH.—Frank Riffe has been made Chief Engineer of the Seattle-Tacoma Electric RR. Co., which Henry Bucey is planning between these places. (March 3, p. 163.)

TORONTO, ONT.—General Manager E. H. Keating, of the Toronto Ry. Co., informs us that the company has had under consideration for some time the advisability of extending its lines in different directions, but so far no definite decision has been reached as to what will be done in this respect. It is generally understood that a system of radial lines will be built to all towns and villages within a radius of 30 miles of Toronto. Surveys have already been completed for several of the extensions. (Jan. 20, p. 55.)

W. T. Jennings, Consulting Engineer of the Metropolitan Ry., is reported as stating that many additions are being made to the rolling stock of the company. A special class of heavily equipped freight cars are to be used. It is possible that connections with the Grand Trunk at Newmarket and Aurora and with the Canadian Pacific at North Toronto will be made.

TORONTO JUNCTION, ONT.—The Toronto Suburban St. Ry. has had its franchise extended 23 years, by agreeing to extend the line to Cooksville or Woodbridge within two years, and to reach both places before the expiration of the present franchise.

TROY, N. H.—The Troy Granite Ry. was incorporated March 1, with a capital stock of \$15,000, to build an electric railroad in Troy. The incorporators are: Orlando W. Norcross, Arthur O. Knight, William J. Denhohn, Albert J. Park, Edward E. Johnson.

UTICA, N. Y.—The Utica Suburban Ry. Co. has been granted right of way for an extension from Genesee St., Utica, to Capron, to connect with the Belt Line tracks in Upper New York Mills via New Hartford. (March 10, p. 181.)

WASHINGTON, D. C.—In the closing hours of Congress a bill was approved authorizing the Washington & Gettysburg Ry. Co. to build a city and suburban division of its line within the District of Columbia. The overhead trolley will be used on this road outside of the city limits. (April 4, 1898, p. 247.)

WARSAW, IND.—Surveys have been completed, according to report, for the three-mile electric railroad between Warsaw and Winona, which Noah J. Clodfelter proposes to build and have in operation before June 1. (Feb. 3, p. 94.)

WHITE PLAINS, N. Y.—The Tarrytown, White Plains & Mamaroneck Ry. Co. has been granted a 99-year franchise by the Highway Commissioners through the town of East Chester as a part of the proposed extension from White Plains to Mt. Vernon. Cars are to be in operation within six months. (Feb. 3, p. 94.)

WOODBURY, CONN.—The Woodbury & Southbury Ry. Co. was incorporated Jan. 23, with a capital stock of \$500,000, to build an electric railroad 32 miles long between the cities of Woodbury and Watertown, and Hotchkissville and Southbury. It is proposed to begin work as soon as the weather permits. The officers are: President, James Huntington; Secretary and Treasurer, Edward S. Boyd, Woodbury; Manager and Purchasing Agent, F. C. Boyd, and Engineer, Chas. Lambert. It is proposed to secure 500 horse-power by utilization of water power. (March 3, p. 163.)

WOONSOCKET, R. I.—The Woonsocket St. Ry., according to report, is considering the advisability of an extension to Fairmont. Several bridges will be needed at railroad crossings.

XENIA, O.—The Xenia & Wilmington Traction Co. was reported incorporated March 7, with a capital stock of \$10,000, to build an electric railroad from Xenia, in Greene County, 18 miles southeast to Wilmington, in Clinton County. Albert Emanuel, Frank S. Breene, Samuel A. Price, Henry B. Pruden and Harry A. Armstrong are among the incorporators. One bridge will probably be necessary for this road.

GENERAL RAILROAD NEWS.

BERCKVILLE, WESTPORT & SAULT STE. MARIE.—E. J. Reynolds, Solicitor for Applicants, has made application to the Parliament of Canada for an act to incorporate a company to acquire this company's property and to operate the same. The B. W. & S. M. runs from Berckville, Ont., to Westport, 45 miles. It has been in the hands of a receiver for several years.

CANADIAN PACIFIC.—H. Campbell Oswald, secretary of the Columbia & Western line of this company, has made application to the Parliament of Canada for an act giving to the company authority to issue first mortgage bonds to be a charge on its railroad, including its main line and branches, not exceeding \$35,000 per mile.

CAROLINA CENTRAL.—All of the old first mortgage bonds except \$65,000, all of the second mortgage bonds except \$22,400, and of the third mortgage bonds and scrip except \$62,833, have been deposited with the trustee under the reorganization agreement. There is to be a new issue of \$3,000,000 4 per cent. bonds guaranteed by the following endorsement:

For value received the Seaboard & Roanoke RR. Co., and the Raleigh & Gaston RR. Co., hereby jointly and severally guarantee the punctual payment of the principal and interest upon this bond, at the time and in the manner therein specified, and covenant severally with the Farmers' Loan & Trust Co., on default in the payment of any part thereof by the obligor, to pay said principal and interest as the same shall become due.

DELAWARE & HUDSON CANAL.—By a decision of the Appellate Division of the Supreme Court of New York, at Albany, this company obtains a new trial in its attempt to obtain right of way through the public lands of the Adirondacks. The decision of Judge Chester, given last November, is reversed. The company proposed to extend its line across the state lands from North Creek, N. Y., northwest about 50 miles to Tupper Lake, to form a connection with the New York & Ottawa line, recently built into Ottawa, Ont. (Nov. 18, 1898, p. 840.)

MISSOURI PACIFIC.—A syndicate has bought \$6,000,000 of 5 per cent. gold trust mortgage bonds of the issue of 1887, owned by the estate of Jay Gould.

NEW YORK, NEW HAVEN & HARTFORD.—On account of the extension soon to be completed on the east side of the Thames River, Conn., the company has given notice that on April 1 it will cease the use of the tracks of the Central Vermont, the Union station at Norwich, and the wharf property in New London.

OREGON PACIFIC.—Bondholders of this company (now the Corvallis & Eastern) have brought suit in the New York Supreme Court against the Farmers' Loan & Trust Co., as trustee, under the \$15,000,000 mortgage of 1880, to determine whether the company has fulfilled all its obligations under the mortgage.

PEORIA, DECATUR & EVANSVILLE.—Baldwin & Boston, representing New York stockholders, have filed a bill in the United States Circuit Court for the Southern District of Illinois, asking that the foreclosure suit under the second mortgage be reopened. The decree was entered in March, 1897. (Feb. 3, p. 95.)

RIO GRANDE WESTERN.—This company has issued a circular to the stockholders, dated March 7, in which they are asked to authorize a mortgage securing a new issue of first consolidated mortgage 4 per cent. gold bonds, running 50 years, with interest payable in April and October. Of this issue will be reserved an amount equal to the present first mortgage to be issued only to retire the same at maturity or sooner, and to retire the first mortgage bonds of the branch companies, amounting to \$2,850,000, and covering 110 miles, in exchange for \$2,200,000 of the new bonds. The mortgage will also provide for the issue of bonds at the rate of \$20,000 per mile for building or acquiring future branches and extensions. The company will be enabled to make an issue to acquire the first mortgage bonds of the Utah Central, which have been guaranteed by the R. G. W., whenever they may be acquired, on terms sufficiently advantageous. It is proposed at once to build a branch up the Provo River Canyon in Utah, and to make extensions of the Pleasant Valley branch to additional coal mines, a total of 25 miles. (See Railroad Construction column.) There will be authorized an issue of \$10,000,000 of the new consolidated bonds for future necessities or equipment and improvements of the property. Of these \$1,000,000 will be issued at once, and the remainder at a rate not exceeding \$500,000 per year. This million dollars, with the \$500,000 needed for the new branches, have been sold to bankers.

SIOUX CITY TERMINAL.—The United States Supreme Court, on Feb. 20, pronounced valid a mortgage for \$1,250,000 made to the Trust Company of North America, at Philadelphia, as trustee, and sustained the decision of Judge Shiras ordering foreclosure. The company's property is controlled by the Sioux City & Northern, and went into the hands of receivers Oct. 10, 1893.

TORONTO, HAMILTON & BUFFALO.—Edward Sweet & Co., of New York, and the American Loan & Trust Co. of Boston, offer at par and accrued interest \$3,280,000 first mortgage 4 per cent. gold bonds, maturing July 1, 1946. They are a first lien upon the 88 miles of line extending from Welland, Ont., to Hamilton, and from Hamilton to Waterford.

WILMINGTON & NORTHERN.—Holders of General Mortgage 5 per cent. gold bonds are notified that the Reading Co., which took possession of the W. & N. on Jan. 1, will guarantee the payment of the principal and interest of these bonds upon presentation of the same to the Vice-President, W. R. Taylor, at Philadelphia. (Jan. 16, p. 18.)

Electric Railroad News.

BALTIMORE, MD.—The United Railways & Electric Co., of Baltimore, filed articles of incorporation March 4. On the previous day the last formalities were concluded transferring to it the various properties included in the consolidation. The stockholders of the various consolidated companies, the City Passenger Ry., and the Baltimore & Northern Electric Ry. Co., adopted resolutions favoring the consolidation. The officers of the new company are: President, Nelson Perin; Vice-President, Col. Walter S. Franklin; General Manager, W. A. House; Treasurer, B. C. Keck; Secretary, H. C. McJilton. The plan for the exchange of bonds and the record of the securities to be issued for completing the consolidation, were given in this column Feb. 10 (p. 111).

BUFFALO, N. Y.—The financial plan for the consolidation of the various street railroads in and around Buffalo is said to contemplate an issue of \$30,000,000 of 4 per cent. bonds, of which \$11,000,000 will be floated, and the remainder devoted to improvements and to take up underlying bonds at

their maturity. Also about \$15,000,000 in stock will be placed, \$5,000,000 in 4 per cent. preferred and \$10,000,000 in common stock. (March 3, p. 164.)

CHATTANOOGA, TENN.—The Chattanooga Belt Ry., which has been in operation by the Chattanooga Rapid Transit Co. on a 45-year lease, was on March 1 taken control of by General Manager Frank S. Gannon, of the Southern Ry., to which company the property belongs.

CHICAGO, ILL.—The outstanding stock issues of the constituent companies, with the ratio of exchange, in consolidation, the various street railroads, and the amount of stock to be issued by the Chicago Consolidated Traction Co., the new company, are given as follows:

Old company.	Stock outstanding.	Ratio of exchange.	Receives in new stock.
Chicago Electric Trans.	\$1,500,000	2½ for 1	\$3,750,000
Chicago & Jeff. Urb.	2,000,000	½ for 1	1,000,000
Cicero & Provid.	2,500,000	½ for 1	1,250,000
Evansston Electric	1,000,000	½ for 1	500,000
North Chicago Electric	2,000,000	1½ for 1	3,500,000
North Side Electric	1,500,000	2 for 1	3,000,000
Ogden Trust	2,000,000	½ for 1	1,000,000
Totals	\$12,500,000		\$14,000,000

The total mileage by the consolidation is 179.44. The present bonded indebtedness of the consolidated companies amounts to \$5,194,000, and the total capital stock of the companies is \$13,150,000. The Chicago North Shore St. Ry. is included in the consolidation only by its lease to the North Chicago Electric Ry. Co., on a guaranteed interest of 6 per cent. on its capital stock of \$650,000 and its \$675,000 of bonds. (Jan. 13, p. 30; March 10, p. 182.)

Dickinson McAllister has made his final report to Judge Seaman and has been relieved as receiver for the Metropolitan West Side Elevated RR. Co. Mr. McAllister had been Receiver since action was first brought for foreclosure against the railroad company in January, 1897. The receiver's final report of the company's finances between Feb. 1 and March 8, is as follows:

RECEIPTS.

Cash balance from January	\$365,273
Cash for fares	11,716
Cash for rents, privileges, etc.	3,653
Total	\$380,642

DISBURSEMENTS.

On account special orders of court	\$32,128
Liabilities of receiver, pay rolls, etc.	77,085
Total	\$109,213
Amount turned over to the company	271,429
(Jan. 27, p. 76; Feb. 10, p. 11.)	

DETROIT, MICH.—The Fort Wayne & Belle Isle Ry. Co., now the Detroit, Fort Wayne & Belle Isle, controlled by the Citizens' Traction Co., has called for redemption on the first day of April, 1899, the \$400,000 bonds, bearing date of Oct. 1, 1892.

EASTON, PA.—The Easton Transit Co. and the Edison Illuminating Co. have given an option on the property to E. B. Smith & Co., of Philadelphia, as representatives of the proposed purchasers, who will consolidate the plants. The Easton Transit Co. has a capital stock of \$300,000, and has a bond issue for a like amount bearing 5 per cent. interest, due in 1922. The capital stock of the Edison Co. is \$312,000.

FREEMPORT, ILL.—The Freeport General Electric Co., operating about six miles of electric railroad, went into the hands of Wm. O. Johnson of Chicago, as receiver March 11, being unable to pay the \$78,500 bonds issued by them. This company was organized Sept. 2, 1895, and has a capital stock of \$150,000.

GALT, ONT.—At the annual meeting of the Galt, Preston & Hespeler St. Ry., Jan. 31, Hugh McCulloch was elected President, and Martin Todd, Vice-President.

NEW ORLEANS, LA.—The New Orleans City RR. Co. has been incorporated as the reorganized New Orleans City & Lake RR. Co. The capital stock of the new company is \$7,500,000, of which \$2,500,000 is preferred and \$5,000,000 common stock. The N. O. C. & L. RR. Co. has heretofore been a part of the New Orleans Traction Co., which, with its constituent companies, is now being reorganized. The new Board of Directors and officers of the new company are: Albert Baldwin, J. C. Denis, F. T. Howard, C. H. Hyams, R. E. Craig, J. B. Levert, A. B. Wheeler, J. C. Russell, R. M. Walmsley. Mr. Walmsley is President and Mr. Baldwin Vice-President. (March 10, p. 182.)

The stockholders of the Canal & Claiborne RR. Co., at a meeting March 4, ratified the action of the Board of Directors in selling the property to the New Orleans & Carrollton RR. Co., and approved the terms of the sale. The transfer will be made the latter part of March. (March 3, p. 164.)

PHOENIXVILLE, PA.—The Montgomery & Chester Electric Ry. Co. has made a mortgage of \$100,000 to the Real Estate Trust Co., of Philadelphia, trustee, to secure funds for the proposed 15-mile line between Pottstown and Phoenixville, which will be built via Limerick Square, Spring City and Royersford. (See Electric Railroad Construction column.)

PITTSBURGH, PA.—Brown Bros. & Co., New York, and Alexander Brown & Sons, of Baltimore, announce in a circular that the Philadelphia Co., of Pittsburgh, offers to exchange \$6,375,000 of its common stock for \$17,000,000 of the common stock of the United Traction Co., provided that a majority of the same is presented for exchange before Jan. 1, 1900. This exchange is for the absorption of the United Traction Co., with the Consolidated Gas Co., the Allegheny County Light Co., and the Chartiers Valley Gas Co. by the Philadelphia Co., whose capital stock was recently increased to \$21,500,000. (Feb. 24, p. 148.)

PROVIDENCE, R. I.—At a meeting of the directors of the United Traction & Electric Co., March 8, Marsden J. Perry was elected Vice-President, succeeding John E. Searles, resigned. The dividend rate was increased from three to five per cent. per annum.

ST. LOUIS, MO.—The Benton-Bellefontaine Ry. Co. has filed a deed releasing the bonds held by the St. Louis Trust Co., as trustee. These bonds were is-

sued by the old company before its absorption by the Union Depot RR. Co.

SYRACUSE, N. Y.—William P. Gannon was elected President of the Syracuse Rapid Transit Ry. Co. Mar. 14. Mr. Gannon was formerly secretary of the company.

TRAFFIC.

Grain Exports for Eight Months.

The exports of breadstuffs and provisions in the past eight months are on the whole satisfactory to New York, almost entirely, however, because this port greatly increased its wheat exports. The gains and losses at other ports are in many cases quite anomalous. The value of the total exports of breadstuffs decreased \$16,000,000, but the exports from New York increased \$3,000,000; there was an increase of \$4,000,000 at Philadelphia, and an increase of the same amount at Boston, and a decrease of like amount at Baltimore. Newport News and Norfolk together lost \$5,000,000; Galveston just held its own, but New Orleans, which was lately threatening with the help of the Mississippi River and new rail connections to do great damage to the Atlantic ports, lost \$7,000,000. There was an increase of 7,000,000 bushels in the export of wheat and an increase here of 17,000,000, about 100 per cent.; but out of a total decrease of 9,000,000 bushels of corn, New York lost 4,000,000 bushels. Baltimore showed its strength as a corn shipping port by suffering no loss, but Norfolk and Newport News lost 6,000,000 bushels, and New Orleans lost 5,000,000, accessible as it is to the corn belt, while Philadelphia gained 3,000,000, and in spite of being so far north Boston gained 1,000,000. New York lost 19,000,000 bushels of oats out of a total decrease of 27,000,000, Philadelphia losing 2,500,000 and Boston experiencing no change. In flour there was an increase of 2,000,000 barrels, but there was practically no change here, there being increases in Boston and Baltimore and a large increase in Philadelphia. The aggregate value of exports of provisions was unchanged, but this port gained \$1,000,000, Philadelphia gained \$2,000,000, and the ports along the Northern border lost a couple of million dollars.—Journal of Commerce (New York).

Chicago Traffic Matters.

Chicago, March 15, 1899.

Chicago and Peoria grain shippers appear not to have made out much of a case of discrimination against the roads east of the Mississippi River at the hearing before the Interstate Commerce Commission in this city. The full commission was present to listen to the arguments of the shippers, who complain that the eastbound roads are making lower rates on export corn from Mississippi River points and west thereof to the Atlantic seaboard, than are made from this city and Peoria. The railroad traffic officers who testified, said that the shippers were fighting a shadow; that the alleged discrimination was a myth, and that there was nothing in the presented rates that could be in any way construed as a discrimination against any city or territory. General Traffic Manager Grammer, of the Lake Shore & Michigan Southern, was the principal witness for the railroads. He said that the 13½-cent export corn rate from Mississippi River points was put in about a year ago as an experiment to see if it would not take a part of the corn movement from the Gulf points. He said the rate was a thorough proportional one, and was so divided by the western and eastern lines that it did not affect the rates from the Chicago district. He said if local grain dealers were unable to export their corn, it was for reasons other than the rates complained of. This latter assertion was partly borne out by the testimony of A. R. Sawers, of the Chicago Board of Trade. It is the general opinion that the commission will throw the case out on account of insufficient evidence on the part of the complainants.

The transcontinental roads from St. Paul have cut their second class one-way passenger rates from the twin cities to north Pacific Coast points to \$25, or \$36.50 from Chicago, against the regular rate of \$51.50 direct from this city. The trouble started over the homeseekers' rates which were put in for March 7.

Eastbound shipments of flour, grain and provisions from Chicago and Chicago Junctions to and beyond the western termini of the Trunk Lines for the four weeks ending March 9, amounted to 498,439 tons, as compared with 596,235 tons for the corresponding period of last year. This statement includes \$1,814 tons of flour, 352,945 tons of grain, and 63,650 tons of provisions. The following table shows the quantities and proportions carried by the respective roads:

	Per cent.
Baltimore & Ohio	59,989
Cleveland, Cin., Chi. & St. Louis	10.5
Chicago & Erie	29,270
Grand Trunk	5.6
Lake Shore & Michigan Southern	53,577
Michigan Central	76,382
New York, Chicago and St. Louis	10.6
Pitts., Cin., Chi. & St. Louis	67,431
Pitts., Ft. Wayne & Chicago	52,680
Wabash	28,949
Totals	52,285
	11.7
	19,185
	4.7
Totals	498,439
	100.0

Eastbound shipments from Chicago as reported weekly by the Board of Trade were, for the four weeks ending March 9, 421,606 tons, as compared with 556,032 tons for the corresponding period of last year. This total of 421,606 tons is made up of 47,047 tons of flour and mill stuffs, 246,866 tons of grain, 52,446 tons of provisions, 35,353 tons of dressed beef, and 39,594 tons of miscellaneous freight.

The statements of freight shipped eastward from Chicago are made up on two bases. The first statement given above is that furnished by the Chicago Freight Committee. It covers only three principal classes of freight, and it includes only such shipments as are carried through to Buffalo, Pittsburgh, Wheeling, etc.; but it includes shipments from all junction points in Cook County, and from some other points, including all from the Elgin, Joliet and Eastern. The second statement does not include shipments from junctions outside the city, but it does include, practically, all kinds of freight, except live stock, and it shows the total shipments by the roads mentioned to all points, both through and local.

The Eastern roads continue to suffer from lack of cars. For more than a month grain has been waiting here for cars, the trouble being partly due to delays caused by snow in the East. The roads are catching up, but it is likely to be 10 days or more before the delayed shipments will all be moving normally.